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Analyzing Healthy Lifestyle Initiatives for Seniors: A Descriptive Study of Senior Centers in Montgomery County, Ohio

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Abstract

The population of the elderly is expected to rise due to an increase in life expectancy and the aging baby boomer population. This increase in the elderly population will likely cause a burden on the health care system. This burden can be mitigated by promoting healthy lifestyles such as increased physical activity, healthy eating, and tobacco cessation in the elderly. Additionally, by participating in healthy behaviors, seniors can significantly improve their quality of life. Senior centers are at the forefront of promoting healthy lifestyles for the elderly. By promoting physical, social, and mental well-being, senior centers act as a focal point for the elderly community. The purpose of this study was to describe organizational policy and environmental initiatives that promote healthy lifestyles for seniors in Montgomery County, Ohio. This study focused on initiatives at five senior centers. Data was collected through key informant interviews using CDC's CHANGE tool focusing on community institutions and organizations. This tool included five sections: physical activity, nutrition, tobacco, chronic disease management, and leadership. Results showed that policy and environmental initiatives were most frequently used in the physical activity and chronic disease management sections. Senior center policy and environmental initiatives promoting healthy nutrition and leadership were less likely to be implemented. Though the CHANGE tool helped identify strengths and weaknesses for the interviewed senior centers, it did little to assess the effectiveness of healthy lifestyle programs. Future research efforts can incorporate measures of participation as an added parameter to the CHANGE tool in order to assess the effectiveness of programming for seniors.

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Background: An Unhealthy Nation

The United States is a world leader in providing health care, however remains below other countries in many indicators of healthy life such as life expectancy, obesity and cancer rates. Healthcare costs continue to rise in the US. The United States spent over $ 2.5 trillion in healthcare expenses in 2009. These rising healthcare costs are result of an increase in the aging population and unhealthy habits of Americans that lead to disease co-morbidities (National Prevention Council, 2011). Promotion of healthy lifestyles can help reduce chronic diseases and therefore lower the cost of healthcare (Hancock & Cooper, 2011).

Purpose Statement

The purpose of this study is to describe policies, environments, and systems that foster healthy lifestyles in senior centers in Montgomery County, Ohio. Specifically, this study highlights tobacco, physical activity, and nutrition programs among Montgomery County senior centers.

Literature Review

Being healthy is more than just being free of disease. Health is a state of physical, social, and mental well-being (WHO, 2011). Some of the strongest predictors of health lie outside of the health care setting. Environmental factors, social and economic status all influence health. Preventing disease by promoting healthy lifestyles is often accomplished by addressing the environmental, social, and economic barriers. Known as primary prevention, addressing healthy living behaviors before chronic diseases develop is a focus of many current American public health efforts (Glanz, Rimer, & Lewis, 2002).

The Centers for Disease Control and Prevention [CDC] (2011a) stresses the importance of promoting healthy behaviors by the initiation of the "Winnable Battles" effort in September, 2010. Winnable Battles are public health priorities that were developed based on the leading causes of chronic disease in the United States. The goal of CDC's winnable battles is to create measurable impact on the targeted public health priorities. Known effective strategies to conquer winning battles include developing policy and environmental initiatives that help make healthy choices accessible to Americans. These strategies are being carried out by community organizations to reduce and prevent chronic diseases caused by unhealthy behaviors (CDC, 2011a).

The CDC identified the following ten focus areas as winnable battles:

- Food Safety
- Global Immunization
- Healthcare-associated Infections
- HIV in the U.S.
- Lymphatic Filariasis in the Americas
- Motor Vehicle Injuries
- Nutrition, Physical Activity, and Obesity
- Mother-to-Child Transmission of HIV/AIDS Globally
- Teen Pregnancy
- Tobacco

The unhealthy habits of Americans often lead to chronic diseases that can be prevented by engaging in more healthy behaviors. Obesity, nutrition, physical activity, and tobacco use are winnable battles that are commonly targeted in the prevention of chronic disease morbidity and disparity (CDC, 2011b).

Behavioral Target: Tobacco Use

Tobacco use is a behavior that contributes to many preventable chronic diseases. Included in these diseases are various forms of cancer and heart disease. In the United States an estimated 443,000 premature deaths annually are attributed to diseases related to tobacco use.

Common forms of tobacco use in the United States include smoking cigarettes, cigars, and pipes and the use of smokeless tobacco (CDC, 2011c; Tobacco Prevention Networks, 2009).

An estimated 46.6 million people, about one in five American adults currently smoke cigarettes or cigars. Daily, about 1,000 people younger than 18 years old become regular smokers. About 1,800 Americans over the age of 18 become regular smokers daily (CDC, 2011c). The CDC reports that in 2009 26.0% of high school students from selected sites throughout the United States reported current tobacco use. This included cigarette, smokeless tobacco, and cigar use (CDC, 2009a).

Smoking cigarettes is not the only way that tobacco is used. Smokeless tobacco products such as chewing tobacco and snuff can also cause cancer and oral health issues such as leukoplakia – a pre-cancerous condition (CDC, 2011h). The CDC reported rates of smokeless tobacco use from the 2009 Behavioral Risk Factor Surveillance Survey (BRFSS). Smokeless tobacco use prevalence among men in the 50 states and Washington, D.C. ranged from 2.0% in Washington, D.C. to 17.1% in West Virginia (CDC, 2010a). Smokeless tobacco use among men was significantly higher than among women in all states. Smokeless tobacco use tended to decrease with increasing education (CDC, 2009b).

Behavioral Target: Physical Activity

Lack of physical activity among Americans is a behavior that contributes to health disparities. Sedentary lifestyles contribute to diseases such as type 2 diabetes and high blood pressure. In a joint position statement released by American College of Sports Medicine and American Diabetes Association (2010), physical activity was shown to prevent or delay the onset of type 2 diabetes. Physical Activity lowered the risk of developing type 2 diabetes by 58 percent. Owen, Wiles and Swaine (2010) showed that exercising less than one hour per week

reduced both systolic and diastolic blood pressure. From baseline, a drop of 10.4 mmHg and 6.7 mmHg in the systolic and diastolic blood pressures, respectively, was observed in the study population.

Types of physical activity includes aerobic and strength building activities. Aerobic activities involve building endurance by increasing the breathing and heart rate of individuals. Examples include swimming and running. Health benefits of aerobic activities include a reduction in the risk for heart disease and stroke. Aerobic activities can also reduce the occurrence of type 2 diabetes. Strength building activities are activities that strengthen muscles and/or bones. Strength training activities provide resistance on the skeletal system and include walking and lifting weights. Strength building activities have been shown to slow the loss of bone density, which can lead to a reduction of hip fractures (CDC, 2011i).

Physical activity can be further classified as either moderate-intensity or vigorous-intensity. Moderate-intensity physical activity is defined as physical activity in which a person's target heart rate should be 50 to 70% of his or her maximum heart rate. For vigorous-intensity physical activity**,** target heart rate should be 70 to 85% of his or her maximum heart rate. The maximum rate is based on the person's age. An estimate of a person's maximum age-related heart rate is obtained by subtracting the person's age from 220 (CDC, 2011d; USDA, 2008a; CDC, 2011e).

Most American adults do not engage in the recommended amount of physical activity. It is recommended that adults engage in 150 minutes a week of moderate-intensity physical activity, or 75 minutes a week of vigorous-intensity aerobic physical activity. Aerobic activity should be performed in episodes of at least ten minutes, preferably spread throughout the week. Adults should also do muscle-strengthening activities that involve all major muscle groups

performed on two or more days per week (CDC, 2011d; U.S. Department of Health and Human Services, 2008). Physical activity guidelines remain the same for older adults, however if older adults cannot engage in the recommended amounts of physical activity due to health conditions, they should be as physically active as their abilities and conditions allow (Fitzpatrick et al., 2008; WHO, 2011a). The CDC reports that only 51 % of adult American age 18 years and older reported engaging in 30 minutes or more of moderate physical activity five or more days a week or 20 minutes of vigorous physical activity three or more days a week in 2009 (CDC, 2009c).

Children and adolescents also do not engage in the recommended amount of physical activity. It is recommended that children and adolescents should engage in one hour or more of physical activity each day. Most of the one hour or more per day should be either moderate-or vigorous-intensity aerobic physical activity. Children and adolescents should engage in vigorous-intensity activity on at least three days per week. Muscle and bone strengthening activities should be included on at least three days per week. In 2009, 23.1% of high school students had not engaged in any kind of physical activity that increased their heart rate and breathing rate for at least 60 minutes per day and five or more days a week (CDC, 2009d).

Behavioral Target: Nutrition

Many Americans consume a high-calorie diet. The consumption of a high calorie diet leads to obesity and other related diseases such as diabetes, heart disease, stroke, and many forms of cancer. Behaviors that contribute to high caloric intake include consumption of large portions and serving sizes, sugary beverages, and fast food.

American portion sizes are significantly larger than recommended. The recommended portion sizes for each food group are provided in Table 1. Portion sizes began to grow in the 1970s and rose sharply in the 1980s. Convenience of fast food and restaurant marketing

contributes to the consumption of larger than recommended portions. The consumption of larger portion sizes has continued in parallel with increasing body weights of Americans (Young & Nestle, 2002).

The USDA recommends that each day individual consume a diet of foods from five food groups. The five food groups are fruits, vegetables, grains, dairy, and protein. The recommendations for every group vary by age, gender, and activity level. Table 1 below displays recommended number of servings. The definition of a serving size differs between each food group. The serving size of grains is defined as one ounce of grains. Examples of one ounce of grains include one slice of bread, half a cup of cooked oatmeal, half a cup of cooked rice, and half a cup of cooked pasta (My Plate, 2011). The definition of a serving size for vegetables depends on whether the vegetables are cooked, raw, or a juice. For example, one cup of raw leafy vegetables, half a cup of other vegetables (cooked or raw), and three fourths of a cup of vegetable juice are each considered a serving of vegetables (Center for Nutrition Policy and Promotion, 2002). Similar to vegetables, the serving size of a fruit is defined depending on whether the fruit is whole, chopped, or in juice form. One whole fruit such as an apple, orange, banana, or pear constitutes one serving of fruits. One-half a cup of chopped fruit and three fourths of a cup of fruit juice are one serving of fruits. Serving sizes in the dairy food group depend on the type of dairy product being consumed. Specifically, if the dairy product is milk, or yogurt, a serving is one cup. Serving sizes of other dairy products such as natural cheese and processed cheese are in ounces. One and a half ounces of natural cheese such as cheddar cheese, and two ounces of processed cheese such as American cheese constitute one serving size. The serving size for the protein food group is based on weight of the food consumed. One serving size is two to three ounces of cooked lean meat, poultry, or fish. Three eggs is equivalent to one

serving size, or three ounces of proteins. See Table 1 for the daily recommended number of servings for each food group.

Table 1. *Number of recommended daily servings by food group and age and gender*

	Food Group				
Age and Gender Group	Grains (servings)	Vegetables (servings)	Fruits (servings)	Dairy (servings)	Protein (servings)
Children ages 2-6, women, and some older adults	6	3	2	2 to 3	2
Older children, teenage girls, active women, and most men	9	4	3	2 to 3	2
Teen boys and active men	11	5	4	2 to 3	3

Source: (Center for Nutrition Policy and Promotion, 2002)

The daily recommended serving amount for fruits is two to four based on age, gender, and activity level. The Center for Nutrition Policy and Promotion (2002) recommends that three to five servings of vegetables be consumed daily. CDC (2010b) indicates that an estimated 32.5% of adults consumed fruit two or more times per day and 26.3% consumed vegetables three or more times per day, far short of the national targets. Consuming adequate amounts of fruits and vegetables has been shown increase the probability of maintaining a healthy weight, to lower the risk of type 2 diabetes, and decrease the risk for heart disease and stroke (WHO, 2004).

Americans consume more than the recommended six servings of grains each day. Most grains consumed in the American diet are refined grains rather than whole grains. Whole grains should constitute one –quarter of each meal consumed (MyPlate, 2011a). Ninety-five percent of Americans do not consume the recommended amount of whole grains. Whole grains are defined as the fruit of the grain whose principal components are the starchy endosperm, germ, and bran. These components are present in the same relative proportions as they naturally exist in the intact grain (Jonnalagadda et al., 2011). Examples of whole grains include brown rice, whole wheat

flour, and oatmeal. Refined grains are processed so that the bran and germ have been removed. White breads and white rice are examples of refined grains. Whole grains have more nutritional benefits and are associated with lower risks of cardiovascular disease, lower waist circumference, lower risk for type 2 diabetes, and decreased risk for certain cancers (Jonnalagadda et al., 2011).

Poor choice of protein is a behavior that contributes to a diet high in calories and fat. Proteins include lean meats, poultry, eggs, beans, nuts, seeds, and seafood (USDA, 2011a). Five to seven ounces of protein should be consumed daily based on age, gender, and activity level. The USDA recommends that twenty percent of protein recommended weekly should be seafood. This is equal to at least eight ounces a week. The average American intake of seafood is only three and a half ounces per week. Meats and poultry should be consumed in their lean forms in order to minimize the consumption of solid fats that accompany them. Lean meats are meats that are low in solid fats (French, Story, Fulkerson, & Hannan, 2004). Meats, poultry, eggs, beans, nuts, seeds, and fish provide proteins that serve as building blocks for bones, muscles, cartilage, skin, and blood. They also provide nutrients such as vitamins B and E, iron, zinc and magnesium. These nutrients help boost the immune system, prevent anemia, and improve bone growth (USDA, 2011e). Moderate consumption of fish also reduces the risk for cardiovascular disease by 36 percent (Center for Nutrition Policy and Promotion, 2011; USDA, 2011a).

Children above age two years and adults do not incorporate adequate amounts of milk and milk-based products in their diet. Children aged two and above and adults should consume two to three servings of dairy products daily. Consumption of adequate amounts of dairy products promotes healthy bones and has been shown to reduce the risk for cardiovascular disease and type 2 diabetes (Center for Nutrition Policy and Promotion, 2002). Because two-

thirds of Americans exceed daily amount of fat needed, it is recommended that fat-free or low-fat (1%) milk be consumed (French, Story, Fulkerson, & Hannan, 2004; USDA, 2011b).

The USDA MyPlate initiative recommends the elimination of sugary beverages as part of its key healthy eating message. Sugary beverages include soft drinks and non-carbonated beverages that are artificially sweetened. Soft drinks are carbonated drinks that contain a caloric or noncaloric sweetener (Allman-Farinelli, 2009). Non-carbonated sugary beverages include fruit drinks, sports and energy drinks, and powered mixes (Smith, Lin, & Lee, 2010). These drinks contain sugars or syrups that are added to a food or beverage during its preparation (USDA, 2011c). These beverages are the primary source of 'added sugars' in the American diet (California Center for Public Health Advocacy, 2009). It is recommended that Americans consume five to nine teaspoons of sugar per day (California Center for Public Health Advocacy, 2009). It is estimated that the average American consumes approximately 22.5 teaspoons of added sugars per day, which far exceeds the recommendations. This data also indicates that almost half of the additional 13.5 teaspoons of sugar are attributed to sugary beverages specifically sodas and fruit drinks (Smith, Lin, & Lee, 2010). Children and adults who consume excess sugary beverages increase their risk of obesity (California Center for Public Health Advocacy, 2009).

The overconsumption of fast-food is contributes to the American obesity epidemic. Fast food is typically high in calories and fat with little nutritive value. A study found that 80% of adults went to fast food restaurants at least once per month and 28% went two or more times a week. Regular fast food consumption (greater than twice weekly) was higher among younger adult men (Anderson, Rafferty, Lyon-Callo, Fussman, & Imes, 2011).

Interventions to Change Unhealthy Behaviors

Unhealthy behaviors such as the overconsumption and under-consumption of the food groups above should be addressed by healthcare practitioners. Multilevel health promotion interventions are recommended to correct the imbalance of unhealthy lifestyles. The levels of interventions are best described and organized in an ecological model. The ecological model focuses on the individual and social factors as targets for promotion of health. It also focuses on interventions that address changes in interpersonal, community, institutional, and public policies (Hochman & Kernan, 2007). All of these variables interact with the other and multiple levels of environmental influences affect health behavior. Figure 1 displays the levels of influence in the ecological model (Sallis, Bauman, & Pratt, 1998; Washington State Department of Health, 2011; Ziegelmann & Lippke, 2007).

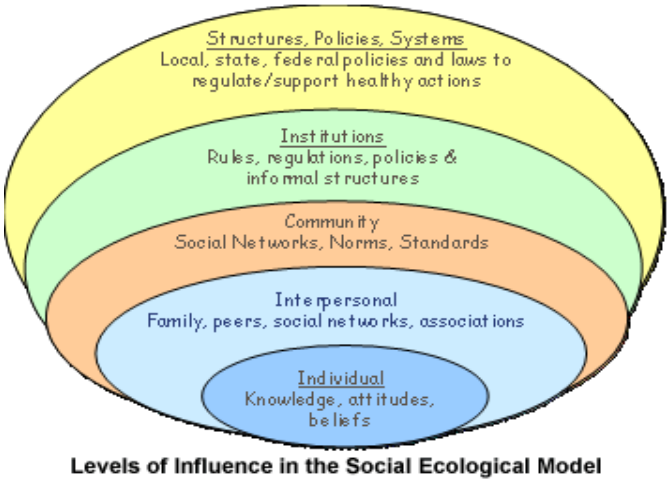

***Figure 1*. Ecological Model**
Source: (Washington State Department of Health, 2011)

Individual and interpersonal interventions

Individuals are at the core of the ecological model. Individuals ultimately control their own behavior through a variety of intrapersonal factors such knowledge, skills, attitudes, beliefs, and willingness to change the behavior. Strategies used by people to live healthier lifestyles

include enrolling in exercise programs, reduce intake of fast food, increase fruit and vegetable consumption, and quit tobacco (Bandura, 2005; Washington State Department of Health, 2011).

Interpersonal interventions are demonstrated in the next layer of the ecological model. Individually focused, interpersonal targets include one's peer groups, family, and other personal associations. An example would a spouse's support in one's decision to quit smoking (Washington State Department of Health, 2011).

Community interventions

After the spheres of influence of individuals and family the ecological model extends to organizations, communities and policy (CDC, 2011f; Sallis & Owen, 2002; Washington State Department of Health, 2011). The influences of one's community, social networks, environment, systems and policies affect their individual behavior. To influence healthy lifestyle behaviors interventions such as media campaigns, environmental modifications and local policies are developed. The goal of many of these interventions is to create better access for individuals to engage in healthy behaviors such as exercising, making better nutritional choices, and choosing not to smoke.

Institutional interventions

The next level of intervention in the ecological model that can aid in promoting healthy behavior is institutional interventions. Local employers, faith-based organizations, and school-based programs play a critical role at this level (Washington State Department of Health, 2011; California Department of Public Health, 2011). One example includes employers implementing policies that encourage their employees to bike or walk to work (Washington State Department of Health, 2011). Another example of an institutional intervention promoting healthy behavior can be seen in faith-based programs. Faith-based institutions can implement policies that

promote the consumption of healthy snacks including fruits and vegetables at their events (California Department of Public Health, 2011).

Policy interventions

The broadest level of intervention in the social ecological model is the policy and system level. At this level, interventions are made in the form of policy decisions passed by the local, state, and federal governments. Environmental changes are also included in this level of intervention, as it is often a policy that precipitates an environmental change (California Department of Public Health, 2011). An example of a policy intervention at the federal level is transportation funding. The Intermodal Surface Transportation Efficiency Act of 1991 provided funding for more than 3,000 new bicycle and walking facilities (Glanz, Rimer, & Lewis, 2002).

Media Campaigns

Media campaigns represent a form of community level intervention in the ecological model (Washington State Department of Health, 2011; California Department of Public Health, 2011). They are designed to increase awareness and knowledge in the general population. Media campaigns that promote healthy habits such as preventing tobacco use, physical activity, and healthy eating are increasing in the United States. Media campaigns are being developed and implemented at the local, state, and national levels using a variety of mediums such as television advertisements, billboards, and social networking websites. Examples of some media campaigns encouraging Americans to choose healthier behaviors are described below.

The *Great American Smokeout* is a national campaign sponsored by the American Cancer Society held annually during the month of November. The *Great American Smokeout* encourages smokers to use the date to make a plan to quit. This campaign encourages people to

make healthier decisions by having a plan that includes having a target date for quitting and having the resources needed to quit available (The American Cancer Society, 2011).

The *GetQuit* media campaign sponsored by Pfizer pharmaceutical company provides tobacco users a step by step plan designed to help quit the habit of smoking. In most cases, tobacco users are prescribed Chantix. Chantix is a non-nicotine medication that targets nicotine receptors in the brain. The medication attaches to the receptors and blocks nicotine from reaching them. This reduces cravings for nicotine. Motivational support is provided throughout the quitting process through regular check in e-mail and telephone calls (Pfizer Incorporated, 2011).

Let's Move! is a national initiative launched by First Lady, Michelle Obama, in 2010 in response to the childhood obesity epidemic. *Let's Move!* encourages healthy eating and physical activity by providing children, parents, schools, and communities with information and resources to create environments that support healthy choices (Let's Move, 2011).

The *MyPlate* media campaign began in 2011 as a nutrition guide depicting a plate divided into four food groups and a glass, the fifth food group. The food groups are visually divided on the plate and picture indicating how much of each food group should be consumed at each meal. *MyPlate* and the related consumer messages simplify dietary recommendations. *MyPlate* is designed to promote consumer compliance in eating the recommended portions of the five food groups (MyPlate, 2011b; USDA, 2011d).

The *5-2-1-Almost None* (5-2-1-AN) media campaign encourages healthy lifestyles by promoting behaviors of healthy eating and physical activity. This media campaign was developed by Nemours Health and Prevention Services in 2007. The behaviors encouraged by *5-2-1-AN* include consumption of at least five servings of fruits and vegetables, limit recreational

screen time to no more than two hours, get at least one hour of physical activity, and drink almost no sugary beverages daily (The Nemours Corporation, 2011).

At the state and local levels, communities are incorporating the *5-2-1-AN* media campaign to promote healthy behaviors. Examples include a state wide initiative, *Let's Go! Maine*, and a city –wide program *Live Well Omaha. Let's Go!* provides city participants with toolkits filled with activities, media, and ideas that help spread the *5-2-1 AN* message. Statewide and community support for *Let's Go!* initiative has been enthusiastic. So far over 345 schools, 163 child care sites, 65 healthcare sites, and 24 after school programs have promoted the 5-2-1 Almost None message to over 123,000 children statewide (Let's Go Maine, 2011; Levi, Segal, St. Laurent, & Kohn, 2011).

Policies

While media campaigns encourage healthy lifestyle behaviors at the local, state and national levels, local policy implementation and/or enforcement is another category of population-based interventions designed to promote healthy behaviors. Local public policy has an impact on community members and whether or not they chose to lead healthy lifestyles. Common policies implemented include tobacco control, standards to increase access to physical activity and healthy foods.

Policies–tobacco

Policies controlling tobacco use include state and local governments increasing taxes paid by people who buy tobacco products. This increases the price an individual pays for these products. In theory, the more tobacco costs, the less tobacco people use. As of August 1, 2011 federal tax on cigarettes is $1.01 per pack. State taxes on cigarettes average $1.46 per pack. The

highest state tax on cigarettes is New York an imposing $4.44 tax per pack. Virginia has the lowest state tobacco tax at $.30 per pack (Campaign for Tobacco Free Kids, 2011; CDC, 2010c).

State and local governments have implemented policies that restrict and/or ban tobacco. While the main goal is to limit nonsmokers' exposure to secondhand smoke, having this type of restriction makes it more difficult for people to smoke. The inconvenience may encourage people to give up using tobacco. Tobacco ordinances are common in schools, medical facilities, hotels, shopping malls, and outdoor places such as parks and beaches (CDC, 2010d; CDC, 2011g). Ossad (2011) reported that 7.4% of the country's population is covered by local and state laws banning smoking as of May 23, 2011.

Medical facilities are an example of how organizations are making strides by implementing tobacco –free campus policies. A study found that 45% of U.S. hospitals have adopted a smoke-free campus policy. This is an increase from approximately three percent of hospitals in 1992. Another 15% reported actively pursuing the adoption of a tobacco policy (Williams et al., 2009).

Policies promoting physical activity

Some worksites are developing policies to encourage people to engage in physical activity. For example, some worksites allot employees time to devote to physical activity. Employees of the Health and Human Services Department in Pueblo of Jemez, New Mexico are allowed 1.5 hours a week to devote to physical activity. In May, 2011 approximately 160 employees had taken advantage of this policy since August, 2010. National companies are creating walking teams and fitness challenges to encourage people to exercise (Levi, Segal, St. Laurent & Kohn, 2011).

Policies promoting physical activity are often aimed at children. These policies are primarily carried out through school districts and child care centers. Levi, Segal, St. Laurent. amd Kohn (2011) report that 1,261 after school sites have added physical activity to the curriculum or increased the amount required, 618 schools added or improved physical education criteria, 594 schools instituted classroom physical activity breaks, and 242 schools added or expanded recess. Elementary schools in Louisville enhanced their wellness policy by increasing physical activity to 30 minutes a day in July, 2010. The Louisville School District plans to enact a policy prohibiting teachers from denying recess for make-up lessons, or disciplinary reasons by August 2011 (Louisville Metro Department of Public Health and Wellness, 2010).

Policies promoting nutrition

Policy changes throughout the country are promoting the consumption of a healthy diet. These policy changes increase access to farmer's markets, improve nutrition in school cafeterias, and raise awareness through restaurant nutrition labeling. In San Diego, a push for farmers' markets to accept for food stamps has resulted in two farmers' markets accepting Electronic Benefit Transfers (EBT). Between August 2010 and January 2011, sales in these farmers' markets increased by nearly $30,000. By the spring of 2012, four more farmers' markets in San Diego will have the ability to accept EBT. A program called Market Bucks, encourages farmers' market customers using EBT to match $5.00 in effort to make local produce more affordable (Levi, Segal, St. Laurent, & Kohn, 2011).

Community healthy living initiatives are also supporting policies that encourage healthier eating in restaurants. These programs are collaborating with local restaurants to provide menu labels. As a result, nutritional information is being displayed on menus in restaurants in Louisville, Seattle, Philadelphia, Nashville, and Somerville, Massachusetts. *Shape up Somerville*

is a community action plan originally funded by a CDC grant and private philanthropists in 2002. Its goal is to promote active and healthy living programs in Somerville, Massachusetts. In addition to providing menu labels, Somerville restaurants have responded by making menu modifications to provide healthier options. This program is led by the health department and includes a collaboration of over 11 initiatives and 25 community stakeholders (City of Somerville, 2011; Curtatone & Economos, 2010).

Policies promoting nutrition and healthy diets are being seen in places of employment throughout communities. Worksites in Monterey County, California have implemented a healthy meetings policy which discourages staff from bringing high fat, high calorie foods such as doughnuts, muffins, and cookies to office meetings. Staff members are also encouraged to celebrate special occasions and show appreciation with flowers and balloons rather than fatty and calorie-dense foods (Ruano, 2011).

Schools are implementing policy changes to improve the nutritional value of their lunches. In the *Live Well Omaha!* initiative, partners commit to implement at least one policy change in their organization related to increased physical activity or healthy food. School districts in Omaha are demonstrating policy change by initiating farm-to-school programs where local fresh produce is used in preparing school lunches. Farmers, schools, and students benefit (Douglas County, 2011). Other US cities using policy to incorporate farm-to-school programs include La Cross, Wisconsin and San Diego, California. San Diego County Consolidated Schools has provided healthier meals to 130,000 students and 15,500. Locally grown fruits and vegetables are now served in more than 8.6 million breakfasts, 13.5 million lunches, and 2.2 million snacks in local schools annually. By the end of the 2010-2011, four LaCrosse School

districts provided over 5,000 pounds of locally grown fruits and vegetables to over 5,000 students (Levi, Segal, St. Laurent, & Kohn, 2011).

Schools are also making policy changes to make school meals more healthy and nutritious. As a result of the *Mayor's Healthy Hometown Movement,* the school district in Louisville, Kentucky agreed to lower the amount of sodium in school meals by an average of five percent in September, 2010. Another nutrition goal of this coalition is to reduce the amount of sugar in all school breakfast and lunch meals by 10% (Louisville Metro Department of Public Health and Wellness, 2010).

National policies are also in place to promote healthy eating for the elderly population. The Senior Farmers' Market Nutrition Program (SFMNP) is an example of such a policy. The USDA provides grants to states so that the low income seniors can afford fruits and vegetables at local farmers' markets. State government provides aid in the form of coupons that can be exchanged for fruits and vegetables at these markets. In 2010, 844,999 seniors were served by this program across 51 state agencies and Native American Tribal governments. The SFMNP represents a policy that aims to improve nutrition among low income seniors in the United States (USDA Food and Nutrition Service, 2011).

Environments

Environmental changes are considered to be a component of the policy and system level of interventions. This is considered the broadest level in the ecological model (California Department of Public Health, 2011). Positive environmental changes can increase physical activity in a community and increase access to healthy foods (CDC, 2012). Environmental barriers such as lack of safe walking routes and access to fresh produce often drive individuals to choose unhealthy behaviors. Modifying the environment is often used to encourage people to

live healthier lifestyles. Examples of environmental modifications include building bike paths and community gardens.

Environmental modifications—tobacco

Tobacco control policies such as bans and restrictions discussed above demonstrate how the environment is modified to reduce tobacco use (CDC, 2011g; CDC, 2010d; Ossad, 2011; Williams et al., 2009). An example worth mentioning is The University of Pittsburgh Medical Center (UPMC). In effort to protect the health of their patients, employees, visitors, UPMC became a smoke-free institution on July 1, 2007. UPMC campus spreads across over 20 hospitals and 400 physicians' offices throughout Western, Pennsylvania (University of Pittsburgh Medical Center, 2007).

Environmental modifications supporting physical activity

Community programs such as *Shape Up Somerville*, *Living Neighborhood and Streets for Healthy Kids* in Denver, and the *Mayor's Healthy Hometown Movement* in Louisville are partnering with local parks , recreation and transportation departments to build and enhance safe sidewalks, streets, trails, and playgrounds (City of Somerville, 2011; Curtatone & Economos, 2010; Louisville Metro Department of Public Health and Wellness, 2010). In Somerville, Massachusetts within one year of the start of *Shape Up*, schoolchildren gained 15 percent less weight than other children their age the United States. Twice as many people were riding bikes along the community's bike path than in the previous year (Hall, 2009).

Several other communities are modifying environments to encourage residents to be more active. In response to *Live Well*, Omaha has installed 80 new bikes racks throughout the city to encourage people to bicycle rather than drive or take public transportation. A zoning amendment was passed in Jefferson County Alabama to preserving more green and open space

in an effort to encourage walking in communities. In Los Angeles, business districts are working to increase access to bicyclers and pedestrians by creating safe walking and biking paths. LaCross County in Wisconsin added six miles of bike lanes to the city to promote bicycling as a mode of transportation (Douglas County, 2011; Levi, Segal, St. Laurent, & Kohn, 2011).

Environmental modifications supporting nutrition

Modifications to the environment can provide better access to healthy foods. For instance, many cities are acknowledging the fact that citizens living in lower-income neighborhoods have a more difficult time accessing fresh produce due to the lack of grocery stores in their environment. As a result, farmers markets are being strategically placed throughout cities in order to ensure access by community residents. The Food Trust in Philadelphia operates over 30 farmers markets, many of which are located in neighborhoods underserved by grocery stores and other fresh food outlets (The Food Trust, 2004). In addition to location of farmers markets in neighborhoods corner store owners are stocking their shelves with healthy food options in Philadelphia and Louisville (Levi, Segal, St. Laurent, & Kohn, 2011). This improvement in nutrition related environment is thought to provide greater access to fresh produce and promote healthy eating.

Community gardens in underprivileged neighborhoods are environmental changes that increase access to healthy foods. *Shape Up! Somerville* planted community gardens to provide fresh produce to citizens (City of Somerville, 2011; Curtatone & Economos, 2010). This increase in the number of community gardens is thought to improve the nutrition related environment within a community. More than 170 community produce beds have been built in the neighborhood of Dorchester, Massachusetts near Somerville. The goal is to have 400 produce beds, as well as several greenhouse plots, serving 1,800 people in Dorchester (Levi,

Segal, St. Laurent, & Kohn, 2011). The environmental change related to community gardens is thought to promote healthy eating by providing greater access to healthy foods.

Policy and Environmental Change Supporting Seniors

While many of the programs, policies, and community initiatives focus on the children and adult populations, there is a lesser amount of focus given to wellness of the elderly. This shortage in focus must be accommodated for by communities across the United States. In order to better target the elderly, it is essential for health practitioners to understand the demographics of the elderly.

Demographic characteristics of the elderly

Understanding the demographic characteristics of a target population will often lead to the development of better health promotion programs. For seniors, aside from age, the demographic characteristics that are most important are low income levels and their high incidences of chronic diseases. A person above the age of 60 is identified as elderly (WHO, 2011b). In 2010, there were over 54 million elderly in the United States (U.S. Census Bureau, 2010). In 2008, more than 50 percent of the elderly had incomes below $25,000. Majority of the income received by elderly comes from Social Security benefits (Social Security Administration, 2010). Elderly are also more likely to have chronic diseases. According to Agency for Healthcare Research and Quality, 75 percent of the elderly suffer from one chronic condition; while as many as 50 percent have two chronic illnesses (AHRQ, 2002). This scarcity of financial resources combined with a high occurrence of chronic diseases should be accounted for by public health experts, while designing programs that promote healthy living for the elderly. Furthermore, local demographic characteristics such as race and education level should also be accounted for while designing programs for a target population.

The increasing elderly population

In 2010 the life expectancy in the United States was 77.9 years. With life expectancies projected to be reaching 85 for women and 83 for men by the year 2075, there will be a substantial increase in the proportion of elderly in the US population (Shrestha, 2006). Additionally, the baby-boomer generation is starting to reach elderly status. It is expected that the population of the elderly will increase due to an increase in life expectancy and the aging baby boomer population (Economics and Statistics Administration, 2005). In 2002, the elderly made up 13 percent of the US population, but consumed 36 percent of healthcare dollars (AHRQ, 2006). The population of the elderly is projected to increase to 19.6 percent of the population in the year 2030. This is equivalent to 71 million elderly living in the United States (CDC, 2003). The increase in the proportion of elderly population will significantly increase the cost of healthcare. It is therefore, essential for communities to focus more on the health and well-being of their elderly population.

Current efforts

Though there is less emphasis on creating health promotion programs for the elderly than younger populations some current efforts do exist. These efforts promote healthy lifestyles in the elderly by focusing on improved nutrition and physical activity and decreasing tobacco use. In order to promote healthy nutrition, increase physical activity, and reduce tobacco use, lifestyle initiatives are designed to change policies and the environment for the elderly (Jackson & Kochtitzky, 2001; Frederick County Government, 2011; Healthways Silver Sneakers Program, 2011; Joyce et al., 2008).

Policy

Policies have been created that aim to improve nutrition, encourage physical activity and decrease tobacco use for seniors. They can help relieve the burden of chronic diseases in the elderly. The Department of Aging in Fredrick County, Maryland developed a policy that encourages healthy eating in the elderly. This policy creates nutrition programs at senior centers in the area. The policy offers lunches daily and one nutrition education class weekly. Meals served offer at least one third of the Recommended Dietary Allowance for older adults and follows the dietary guidelines for Americans (Frederick County Government, 2011).

Policy changes are also making positive strides in encouraging seniors to be more active. SilverSneakers is a nationwide program that helps the elderly improve the quality of their life by encouraging physical activity. This program is funded through the Medicare and its participating health plans. Seniors enrolled in select Medicare participating health plans are eligible for free memberships to local YMCAs, gyms, and fitness centers that offer specialized programs and classes geared toward senior citizens. While most leading Medicare plans offer this program, participating plans vary by state. Free of cost, this program offers access to physical activity by providing seniors with an opportunity to engage in an active lifestyle (Healthways Silver Sneakers Program, 2011). The SilverSneakers program is growing rapidly. An example of the SilverSneakers program can be seen at the Allegheny Valley YMCA near Pittsburgh, Pennsylvania. The Allegheny Valley YMCA recorded a total of 1300 SilverSneakers members enrolled in 2008 (Allegheny Valley YMCA, 2011). The policy change of improving access to physical activity facilities such as local YMCAs has led to lifestyle improvements for the elderly.

Smoking is especially harmful to the elderly, as smoking can accelerate the aging process (Nicita-Mauro, Maltese, Nicita-Mauro, Lasco, & Basile, 2010). Smoking also increases the

incidences of chronic diseases such as dementia, osteoporosis, COPD, and diabetes that are already prevalent in the elderly (Nicita-Mauro et al., 2010). Polices that promote smoking cessation in the elderly have been effective. The Medicare Stop Smoking Program (MSSP) is a policy that is sponsored by Medicare that assesses the effectiveness of two types of smoking cessation therapies. In this program, Medicare plans cover the cost of smoking cessation pharmacotherapy and counseling services. Joyce et al. (2008) found that seniors were more successful at smoking cessation when these therapies were covered by Medicare insurance. 14.1 percent of seniors quit smoking with the provider counseling therapy and 15.8 percent of seniors quit smoking with pharmacotherapy (Joyce et al., 2008). By covering the costs of smoking cessation programs Medicare has introduced a policy change that has led to systematic implications for the health of their beneficiaries.

Environment

Environmental factors can also have a significant impact in promoting health. The environment can both enable and disable the elderly from participating in healthy living activities. By providing access to bike paths, sidewalks and parks, a community can positively influence the health outcomes of its residents (Jackson & Kochtitzky, 2001). Extreme weather is a barrier to physical activity for seniors. A study conducted by the Winter Park Health Foundation, addressed this barrier by introducing the LifeSteps Mall-Walking Program. This program allowed seniors to use a shopping mall to stay out of the weather and continue being physically active (Brown, Rabiner, Wiener, & Gage, 2006). Programs that enable the elderly to engage in physical activity by decreasing environmental barriers are successful in promoting healthy lifestyle modifications.

Senior centers

Senior centers are recognized as important sources of information and programs for elderly adults. Many senior centers are designated as focal points in communities by the Older Americans Act (Gitelson, Ho, Fitzpatrick, Case, & McCabe, 2008). The National Council on Aging estimates that there are over 15,000 centers in the United States serving over 10 million older adults. By promoting physical, social, and mental well-being, senior centers can play a role in supporting healthy lifestyles in the elderly. There are two models of senior centers. One is called the "social agency model", where the senior center provides services to those in need. The second model views senior centers as voluntary organizations where services are provided to members according to which organization they joined (Gitelson et al., 2008).

The social agency model senior centers offer congregate meal programs designed to help elderly people with the greatest economic and social needs. They are funded by federal subsidies through the Title III National Nutrition Program. At senior centers, the congregate meal programs offered tend to serve older adults who are less well off than the general population of elders being served at senior centers (Gitelson et al., 2008). A study of nine senior centers in Arizona and 10 senior centers in South Carolina noted that 47% of older adults who participated in the centers' congregate meal programs had an annual household income of less than $12,000. In addition, 60% of participating seniors had 12 years or less of education which shows that income and education play a role in nutrition. Seniors in this study self-reported that the meal was an important source of nutrition and it represented their main meal of the day.

Voluntary 'club based participation', senior centers can address the social needs of members by offering programs that promote physical activity. One such program was conducted at the Georgian senior centers, where sixteen sessions each day/week focused on educator-led

chair exercises and promotion of walking, using a pedometer, and recording the number of steps taken daily. This program resulted in an increase in physical performance. In addition, the program decreased safety concerns as a barrier to physical activity. This increased level of physical activity is associated with an overall sense of physical well-being, maintenance of a healthy body weight, lower risk of developing chronic disease, lower mortality rate, and management of mild-to-moderate depression and anxiety (Fitzpatrick et al., 2008).

Research Questions

The following research questions will be addressed:

- To what extent do senior centers in Montgomery County institute a policy for offering healthy food alternatives?
- To what extent do senior centers guide portion sizes in foods served?
- To what extent do senior centers label available food according to nutritional content?
- To what extent do senior centers in Montgomery County have policies regulating vending machine options?
- To what extent do senior centers in Montgomery County institute a tobacco-free environment?
- To what extent do senior centers in Montgomery County refer patrons to tobacco cessation programs and services?
- To what extent do senior centers in Montgomery County promote the use of recreational areas designated to engage in physical activity?
- To what extent do senior centers in Montgomery County offer classes or programs that encourage physical activity?
- To what extent do senior centers use wellness committees or wellness coordinators?

- To what extent do senior centers offer educational opportunities to help address risk factors for chronic disease?
- To what extent do senior centers offer routine screenings to address risk factors for chronic disease?

Methods

Study Design

A cross-sectional study was conducted analyzing the current state of healthy lifestyle programs at senior centers in Montgomery County, Ohio. Senior centers were surveyed regarding their current policy and environmental initiatives that promote healthy living among the elderly. The Institutional Review Board at Wright State University approved this study (SC#4737). A copy of the approval letter is provided in Appendix F.

Setting

Senior centers in Montgomery County, Ohio were interviewed. Montgomery County is located in southwestern Ohio approximately 55 miles from Cincinnati, Ohio. Montgomery County is primarily an urban and suburban area that houses several cities and townships within the Dayton Metro area. Dayton/Montgomery County is located where Interstate 75 North/South meets Interstate 70 East/West (Dayton Montgomery County & Visitors Bureau, 2008). The 2010 Census reported a population of 535,153 people residing in Montgomery County. Fifteen percent of the population is over the age of 65 years (U.S. Census Bureau, 2011).

Target Population

The Area Agency on Aging PSA-2 (AAA) area serves nine counties in southwest Ohio. The AAA reports that there are 17 senior centers in Montgomery County (Ohio Department of Aging, 2011). These senior centers serve the elderly population in their communities. Senior

centers provide services such as lunch programs, exercise programs, card game programs, and arts and crafts programs (Vandalia Senior Center, 2011).

Sample

A list of senior centers was obtained from the Ohio Department of Aging website (Ohio Department of Aging, 2011). All 17 of the listed senior centers in Montgomery County were then entered into Microsoft Excel. Nine of these senior centers were removed from the list because they were interviewed by another MPH student. The remaining eight senior centers were selected. One of the eight senior centers no longer existed and another did not offer any senior programs. A third senior center did not respond to the request to participate. Five of the eight senior centers agreed to participate in the study.

Data Collection Instrument

The Community Health Assessment and Group Evaluation (CHANGE) tool, a data collection instrument developed by the Centers for Disease Control and Prevention (CDC), was used to collect data from the senior centers in Montgomery County, Ohio. The purpose of this tool is to help build healthier communities by identifying community assets and potential areas for improvement. This tool divides the community into five sectors. These five sectors are Community-at-Large Sector, Community Institution/Organization (CIO) Sector, Health Care Sector, School Sector, and Work Site Sector. Each sector represents a different facet of the community that can impact healthy living. Senior centers fall within the Community Institution / Organization (CIO) Sector of the CHANGE tool. As a result, the CIO sector was used for data collection (CDC Healthy Communities Program, 2010).

The tool for the CIO sector is divided into six different data collection categories. These categories are demographics, physical activity, nutrition, tobacco, chronic disease management, and leadership. The purpose of the demographic section is to describe an organization's social

and economic characteristics. The tobacco, nutrition and physical activity categories highlight the organization's policy based and environment based strategies that enhance healthy living for its patrons. The chronic disease management section focuses on how an institution can promote prevention of chronic diseases and early detection of chronic conditions through symptom recognition and health screenings. Lastly, the leadership section of the questionnaire focuses on an organization's ability to head community efforts to promote healthy lifestyles. The CHANGE tool questions are presented in Appendix A. This tool was used as an interview guide for the interviews conducted at senior centers (CDC Healthy Communities Program, 2010).

CHANGE Tool Pilot

A pilot of the interview guide was conducted prior to its use at senior centers. This testing was performed at the Master of Public Health Program at Wright State University. Three community members, a faculty member, an administrator, and a student, participated. The pilot took approximately one hour and fifteen minutes. Food was provided.

Many valuable lessons were learned during this pilot. Participants recommended that a copy of the CHANGE tool be provided in order to help interviewees follow the questions. Participants suggested that the font sizes for questions be made larger for elderly participants. This helped ensure that the questions could be read with ease during the interview process. Additionally, the participants in the pilot found it difficult to separate policy ratings from environmental ratings of the CHANGE tool. It was suggested that in order to address this issue during interviews at senior centers, questions in the physical activity, nutrition, tobacco, chronic disease management, and leadership sections of tool be asked twice. The first time the questions asked for the participants to rate the policy category. The questions were then repeated on a section-by-section basis to obtain the environmental ratings. Furthermore, participants in the

pilot preferred to have the main point of questions identified. In order to aid the interviewees at the senior centers identify the main points, part of certain questions were bolded. For example, question two in the physical activity section asked participants to rank the extent to which their organization "Provide a safe area outside to walk or be physically active?" Participants in the trial run recommended that the words "safe area" be bolded for clarification. The interview process was modified to incorporate these suggestions. A complete copy of the interview guide as it was used during the interview process at senior centers can be seen in Appendix E.

Data Collection Process

The senior center administrators were contacted via telephone and interviews were scheduled for April 2012. One hour of time was allotted for each interview. For each senior center, a group interview with an administrator, an activities coordinator, and two senior center participants, if possible, was requested. Five senior centers agreed to participate in the study. One senior center did not respond to the request for participation. One of the senior centers on the list from Area Agency on Aging (AAA) did not offer any form of senior programming. Another senior center on AAA list no longer existed. A script was used during the scheduling of these interviews (see Appendix B). One incentive for senior centers to participate was that they could use the final results to identify their strengths and weaknesses. Additionally, these strengths and weaknesses could be used to compare one senior center's performance to others in the community. Notes were taken to record responses received.

Interviews took an average of one hour and five minutes to conduct. Groups interviewed ranged in size from one to five participants. A script was also used to guide the interview (see Appendix C). The main purpose of this script was to provide ice-breaker questions at the beginning of each interview. The answers to these questions were not recorded.

Following the CHANGE protocol, one score per item was recorded. Individual items were read by the principal investigator and a score of one to five was assigned. A score of one indicated that there were no policy or environmental initiatives in place, and a score of five indicated that the environmental item or policy was fully implemented. Additionally, a value of 99 was given for questions that do not apply. Study participants were provided a rubric of this scale. The rubric explained the meaning of each score, from one to five, for policy and environment initiatives. A copy of this rubric is attached as part of Appendix E. In conjunction to the self-assessed numeric scores, notes were also recorded to justify the score given for a particular question. No personal information about the interviewees was recorded.

The notes and scores were hand written on a copy of the CHANGE tool. Following the interview, these handwritten scores and notes were entered into the CDC provided Excel sheet (CDC CHANGE, 2011). A copy of this tool can be seen in Appendix D. A separate Excel file was created for every senior center. All five of these Excel sheets were then combined into one master sheet. Additionally, all data files were Macro enabled and secured in accordance to the CDC CHANGE tool guidelines.

Data Analysis

The combined master spreadsheet was used to calculate descriptive statistics (frequencies, averages and ranges). Overall environment and policy average scores were calculated for each of the five sections: physical activity, nutrition, tobacco, chronic disease management, and leadership. Additionally, standard deviations were calculated for each section of the CHANGE tool.

Senior center scores were categorized into high, average, and low categories based on their overall scores in each section of the CHANGE tool. Individual questions were also

grouped into high, average, and low categories based on question-specific averages compared to the overall averages for each section. The average category was defined as average scores that fell within one standard deviation of the average score for the section. Average scores greater than one standard deviation above the aggregate averages were categorized as high. Average scores greater than one standard deviation below the aggregate averages were categorized as low. In addition to these categories, themes were identified based on interview comments in order to help determine the areas of senior healthy living that need more focus.

Results

Average Policy and Environmental Scores

The results obtained were categorized into three sections; Average Policy and Environmental Scores, Ranked CHANGE Section Scores, and Question Specific Scores. The first section includes the average scores for all five senior centers. These percentage scores were calculated by aggregating the individual scores (one to five) and dividing them by the maximum possible score for each section. The average score for Montgomery County senior centers for policies that promote healthy lifestyles was 75.2%. The highest percentage score for policies being implemented by senior centers was for chronic disease management with an average score of 86.0%.

Table 2. *Average Policy Scores*

CHANGE Category	Average Score
Overall Policy	75.2%
Physical Activity	76.4%
Nutrition	69.0%
Tobacco	77.4%
Chronic Disease Management	86.0%
Leadership	67.3%

The lowest average policy score was 67.3% for policies that promote leadership through a wellness committee, incentives for participants, and evaluations of health promotion programs. The average policy scores for senior centers are shown in Table 2.

The average environmental score for promoting healthy lifestyles in Montgomery County senior centers was 74.7%. The highest score for environmental practices in the physical activity section was 80.4% for providing walking paths, bike racks, fitness centers, and physical activity classes. The lowest score was in nutrition section, with an average of 69.9% for providing environments that promote healthy foods and beverages. Table 3 shows the average environmental scores for senior centers.

Table 3. *Average Environment Scores*

CHANGE Category	Average Score
Overall Policy	74.7%
Physical Activity	80.4%
Nutrition	69.9%
Tobacco	72.7%
Chronic Disease Management	79.0%
Leadership	71.6%

Ranked CHANGE Section Scores

The second part of the results obtained highlights how each senior center scored on individual sections of the CHANGE tool. The sections of the CHANGE tool are physical activity, nutrition, tobacco, chronic disease management, and leadership.

The policies of two senior centers fell into the low range. The policy sections in which one senior center was ranked low were nutritional policies that promote healthy food and beverage consumption and leadership policies. The policy sections in which at least two senior centers ranked high were promoting physical activity, healthy nutrition, chronic disease management, prohibiting tobacco use, and providing leadership to promote healthy living. Two

of the senior centers ranked in the high range for four out of the five sections of the CHANGE tool. A detailed list of categorized senior center policy scores by CHANGE tool sections can be seen in Table 4 below.

Table 4. *Categorized senior center policy scores by CHANGE tool sections*

		LOW (0% to 40%)	AVERAGE (41% to 80%)	HIGH (81% to 100%)
Senior Center Policy (SCP) Numbers indicate the site.	Physical Activity		SCP2, SCP3, SCP5	SCP1, SCP4
	Nutrition	SCP5	SCP1, SCP4	SCP2, SCP3
	Tobacco		SCP2, SCP4, SCP5	SCP1, SCP3
	Chronic Disease Mgt		SCP4	SCP1, SCP2, SCP3, SCP5
	Leadership	SCP4	SCP2, SCP5	SCP1, SCP3

The rankings for implementation of environments in senior centers that support healthy lifestyles are shown in Table 5. One out of the five senior centers' environmental implementations scored in the low range. The environmental strategy section in which this senior center ranked low was nutrition. Four senior centers' environmental initiatives were ranked in the high range in at least one section of the CHANGE tool. The sections in which at least one senior center ranked high on environmental approaches were for promoting physical activity, healthy nutrition, chronic disease management, prohibiting tobacco use, and providing leadership for promoting healthy lifestyles. One senior center ranked high in all five of the categories.

Table 5. *Categorized senior center environment scores by CHANGE tool sections*

		LOW (0% to 40%)	AVERAGE (41% to 80%)	HIGH (81% to 100%)
Senior Center Environments (SCE) Numbers indicate the site.	Physical Activity		SCE2, SCE3, SCE5	SCE1, SCE4
	Nutrition	SCE5	SCE4	SCE1, SCE2, SCE3
	Tobacco		SCE2, SCE3, SCE4, SCE5	SCE1
	Chronic Disease Mgt		SCE4, SCE5	SCE1, SCE2, SCE3
	Leadership		SCE2, SCE4, SCE5	SCE1, SCE3

Question Specific Scores

The last part of the results section highlights how all of the senior centers scored on the individual questions that were asked in the five sections of the CHANGE tool. Scores for each section of the CHANGE tool were averaged across all senior centers. The first part of this section summarizes the results obtained from policy responses. The second part will summarize the findings of environmental practices being implemented by senior centers in Montgomery County, Ohio.

Question specific scores–policy responses

The average rank for policies that promote physical activity among the elderly was high with a small standard deviation. The aggregate average rank for the 11 items ranked in this category was 3.9 (Std. Dev. 0.86). This resulted in an average score of 76.4%. There were no responses in the high category (4.7-5.0). Senior centers' responses ranked within the low category on one question (1.0-3.0). Policies promoting stairwell use ranked greater than one

standard deviation below the sectional average. The overall sectional averages and question specific averages for policies promoting physical activity are detailed in Table 6.

Table 6. *Average Physical Activity Policy Responses*

	Avg	Min	Max
Average Physical Activity Policy Score:	76.4%	62.0%	98.2%
Physical Activity Policy Response Average:	3.9*	1.8	4.6
Rank by Item			
6. Provide access to onsite fitness center, gymnasium, or physical activity classes?	4.6	4.0	5.0
10. Provide opportunity for unstructured play or leisure-time physical activity?	4.6	4.0	5.0
13. Provide direct support or supporting community-wide physical activity opportunities?	4.5	4.0	5.0
3. Designate a walking path on or near building property?	4.4	4.0	5.0
9. Provide access to a broad range of competitive and noncompetitive physical activities that help to develop the skills needed to participate in lifetime physical activities?	4.4	4.0	5.0
5. Enhance access to public transportation within reasonable walking distance?	4.3	3.0	5.0
8. Provide bicycle parking for patrons?	3.8	1.0	5.0
7. Provide a changing room or locker room with showers?	3.8	1.0	5.0
4. Encourage non-motorized commutes (e.g., active transportation such as walk or bike) to the facility?	3.4	1.0	5.0
2. Provide a safe area outside to walk or be physically active?	3.2	1.0	5.0
1. Promote stairwell use?	1.8	1.0	4.0
11. Prohibit using physical activity as a punishment?	N/A	N/A	N/A
12. Restrict screen time to less than 2 hours per day for children over 2 years of age?	N/A	N/A	N/A

*Standard Deviation = 0.86

Of the eleven items ranked in the physical activity section, nine were ranked in the average range. Promotion of stairwell use as a form of physical activity was consistently ranked

low by senior centers. Participants at senior centers indicated that two of the items in the physical activity section were not applicable for their organization.

The aggregate average ranking for the 12 items ranked in the nutrition policy section of the CHANGE tool was 3.1 (Std. Dev. 1.4). This resulted in an average score of 69.0%. The responses ranged high (4.5-5.0) on two items and low (1.0-1.7) on three items. Policies that provide cool drinking water to patrons at no cost and policies that directly support community-wide nutrition opportunities were ranked in the high category. Policies promoting healthy food and beverage options in the vending machines, banning marketing of less than healthy foods onsite, and providing a comfortable private space for women to breastfeed were ranked in the low range. The averages for policies promoting healthy nutrition for the elderly are detailed in Table 7.

Table 7. *Average Nutrition Policy Responses*

	Avg	Min	Max
Average Physical Activity Policy Score:	69.0%	27.3%	92.5%
Physical Activity Policy Response Average:	3.1*	1.0	5.0
Rank by Item			
10. Provide safe, unflavored, cool drinking water at no cost to patrons?	5.0	5.0	5.0
12. Provide direct support for supporting community-wide nutrition opportunities?	4.7	4.0	5.0
5. Institute healthy food preparation practices in onsite cafeteria and food venues?	4.0	1.0	5.0
6. Institute pricing strategies that encourage the purchase of healthy food and beverage options?	4.0	1.0	5.0
8. Provide smaller portion sizes in onsite cafeteria and food venues?	4.0	1.0	5.0
3. Institute healthy food and beverage options in onsite cafeteria and food venues?	3.8	1.0	5.0
4. Institute healthy food purchasing for cafeteria and onsite food venues?	3.8	1.0	5.0
2. Institute healthy food and beverage options at institution-sponsored meetings and events?	2.8	1.0	5.0
9. Institute nutritional labeling at onsite cafeteria and food venues?	2.3	1.0	5.0
1. Institute healthy food and beverage options in vending machines?	1.5	1.0	2.0
7. Ban marketing of less than healthy foods and beverages onsite?	1.0	1.0	1.0
13. Provide a comfortable, private space for women to nurse or pump to support and encourage patrons' ability to breastfeed?	1.0	1.0	1.0
11. Prohibit using food as a reward or punishment?	N/A	N/A	N/A

*Standard Deviation = 1.40

The overall average ranking for senior center policies prohibiting the use of tobacco was 4.1 (Std. Dev. 1.3). This resulted in an average score of 77.4%. In this section no items were ranked high. The only item that was consistently ranked low (1.0-2.8) was policies promoting the use of tobacco cessation resources such as a quitline. A detailed summary of results obtained from the tobacco policy section can be seen in Table 8.

Table 8. *Average Tobacco Policy Responses*

	Avg	Min	Max
Average Physical Activity Policy Score:	77.4%	60.0%	95.0%
Physical Activity Policy Response Average:	4.1*	1.8	5.0
Rank by Item			
1. Institute a smoke-free policy 24/7 for indoor public places?	5.0	5.0	5.0
2. Institute a tobacco-free policy 24/7 for indoor public places?	5.0	5.0	5.0
5. Ban tobacco vending machine sales?	5.0	5.0	5.0
6. Ban tobacco promotions, promotional offers, and prizes?	5.0	5.0	5.0
7. Ban tobacco advertisement?	5.0	5.0	5.0
3. Institute a smoke-free policy 24/7 for outdoor public places?	3.0	1.0	5.0
4. Institute a tobacco-free policy 24/7 for outdoor public places?	3.0	1.0	5.0
8. Implement a referral system to help patrons to access tobacco cessation resources and services, such as a quitline?	1.8	1.0	3.0

*Standard Deviation = 1.31

Policies that promote chronic disease management through regular preventative screenings and education had an overall average rank for the eight items in this category was 4.1 (Std. Dev. 0.41). The small standard deviation of 0.41 indicates little variation in rankings across items. This resulted in an average score of 86.0%. Average responses from senior centers were high (4.5-5.0) in one item and low (1.0-3.7) in another item. Policies that promote the implementation of an emergency plan were ranked high by senior centers. Low rankings were recorded for policies adopting a curriculum to raises awareness of the signs and symptoms of heart attacks and stroke. Table 9 summarizes the average responses for the chronic disease management section.

Table 9. *Average Chronic Disease Management Policy Responses*

	Avg	Min	Max
Average Physical Activity Policy Score:	86.0%	57.5%	100.0%
Physical Activity Policy Response Average:	4.1*	3.5	4.8
Rank by Item			
8. Have an emergency response plan in place?	4.8	4.0	5.0
2. Provide access to an onsite nurse?	4.5	3.0	5.0
3. Provide an onsite medical clinic to monitor and address chronic diseases and related risk factors?	4.3	3.0	5.0
4. Provide routine screening, follow–up counseling and education to patrons to help address chronic diseases and related risk factors?	4.3	3.0	5.0
6. Adopt curricula or training to raise awareness of the importance of calling 9-1-1 immediately when someone is having a heart attack or stroke?	4.0	2.0	5.0
7. Promote chronic disease prevention to patrons?	4.0	3.0	5.0
1. Provide access to chronic disease self-management programs?	3.8	1.0	5.0
5. Adopt curricula or training to raise awareness of the signs and symptoms of heart attacks and strokes?	3.5	1.0	5.0

*Standard Deviation = 0.41

Organizational policies that demonstrate community leadership in promoting healthy lifestyles by senior centers received an average ranking of 3.32 (Std. Dev. 0.90). This resulted in an average score of 67.3%. Two items ranked low (1.0 - 2.4) and one item ranked high (4.2 - 5.0) in this section. Having a mission statement that supports patrons' health and well-being ranked high among leadership policies for senior centers. Leadership policies that ranked low were having a wellness committee and policies that incentivize senior center patrons to participate in chronic disease prevention measures. A summary of policy response averages for the leadership section can be seen in Table 10.

Table 10. *Average Leadership Policy Responses*

	Avg	Min	Max
Average Physical Activity Policy Score:	67.3%	38.0%	100.0%
Physical Activity Policy Response Average:	3.3*	2.0	5.0
Rank by Item			
6. Have a mission statement that includes the support of or commitment to patron health and well-being?	5.0	5.0	5.0
5. Have a health promotion budget?	4.2	1.0	5.0
3. Have a wellness coordinator?	3.8	2.0	5.0
9. Provide opportunities for patron feedback about health promotion programs?	3.6	2.0	5.0
10. Participate in community coalitions and partnerships to address chronic diseases and related risk factors?	3.4	1.0	5.0
7. Implement a needs assessment when planning a health promotion program?	3.2	1.0	5.0
8. Evaluate health promotion programs?	3.0	1.0	5.0
2. Participate in the public policy process to highlight the need for community changes to address chronic diseases and related risk factors?	2.8	1.0	5.0
1. Provide incentives to patrons participating in chronic disease prevention measures (e.g., quit smoking, log miles walked, blood pressure or cholesterol screening)?	2.3	1.0	5.0
4. Have a wellness committee?	2.0	1.0	5.0

*Standard Deviation = 0.90

Question specific rankings–environmental responses

In addition to policy responses, senior centers also rated their organization's environmental strategies to promote healthy lifestyles for the elderly. The environmental rankings were recorded for all five sections of the CHANGE tool.

The cumulative average for senior centers' environmental implementations promoting physical activity was 4.0 (Std. Dev. 0.93). This resulted in an average score of 80.4%. No items were ranked high (4.9 – 5.0) in this section. Environmental strategies promoting stairwell use consistently ranked low (1.0 – 3.0). Average environmental responses for the physical activity section of the CHANGE tool can be seen in Table 11.

Table 11. *Average Physical Activity Environment Responses*

	Avg	Min	Max
Average Physical Activity Policy Score:	80.4%	58.2%	94.6%
Physical Activity Policy Response Average:	4.0*	1.5	4.6
Rank by Item			
2. Provide a safe area outside to walk or be physically active?	4.6	3.0	5.0
6. Provide access to onsite fitness center, gymnasium, or physical activity classes?	4.6	4.0	5.0
10. Provide opportunity for unstructured play or leisure-time physical activity?	4.6	3.0	5.0
3. Designate a walking path on or near building property?	4.4	3.0	5.0
5. Enhance access to public transportation within reasonable walking distance?	4.4	2.0	5.0
9. Provide access to a broad range of competitive and noncompetitive physical activities that help to develop the skills needed to participate in lifetime physical activities?	4.4	3.0	5.0
8. Provide bicycle parking for patrons?	4.2	1.0	5.0
13. Provide direct support for supporting community-wide physical activity opportunities?	4.2	1.0	5.0
4. Encourage non-motorized commutes to the facility?	3.4	2.0	5.0
7. Provide a changing room or locker room with showers?	3.4	1.0	5.0
1. Promote stairwell use?	1.5	1.0	2.0
11. Prohibit using physical activity as a punishment?	N/A	N/A	N/A
12. Restrict screen time to less than 2 hours per day for children over 2 years of age?	N/A	N/A	N/A

*Standard Deviation = 0.93

The average ranking for nutritional environments promoting healthy eating for the elderly was 3.4 (Std. Dev. 0.91). This resulted in an average score of 69.9%. High (4.3 – 5.0) rankings for two items and low (1.0 - 2.5) rankings for three items were reported. High items included senior centers' environmental strategies for providing cool drinking water at no cost to its patrons and for providing direct support for community-wide nutritional opportunities. Low rankings were reported for environmental implementations that provide patrons space to breastfeed, that institute nutritional labeling at onsite food venues, and that institute healthy food and beverage options in vending machines onsite. Table 12 shows a summary of average responses for nutritional environments section.

Table 12. *Average Nutrition Environment Responses*

	Avg	Min	Max
Average Physical Activity Policy Score:	69.9%	30.9%	97.8%
Physical Activity Policy Response Average:	3.4*	2.0	5.0
Rank by Item			
10. Provide safe, unflavored, cool drinking water at no cost to patrons?	5.0	5.0	5.0
12. Provide direct support for supporting community-wide nutrition opportunities?	4.8	4.0	5.0
5. Institute healthy food preparation practices in onsite cafeteria and food venues?	4.0	1.0	5.0
6. Institute pricing strategies that encourage the purchase of healthy food and beverage options?	4.0	1.0	5.0
8. Provide smaller portion sizes in onsite cafeteria and food venues?	4.0	1.0	5.0
4. Institute healthy food purchasing for cafeteria and onsite food venues?	3.8	1.0	5.0
2. Institute healthy food and beverage options at institution-sponsored meetings and events?	3.4	1.0	5.0
3. Institute healthy food and beverage options in onsite cafeteria and food venues?	3.3	1.0	5.0
7. Ban marketing of less than healthy foods and beverages onsite?	3.0	1.0	5.0
13. Provide a comfortable, private space for women to nurse or pump to support and encourage patrons' ability to breastfeed?	2.3	1.0	5.0
9. Institute nutritional labeling at onsite cafeteria and food venues?	2.3	1.0	5.0
1. Institute healthy food and beverage options in vending machines?	2.0	1.0	3.0
11. Prohibit using food as a reward or punishment?	N/A	N/A	N/A

*Standard Deviation = 0.91

The overall average for senior centers' environmental approaches prohibiting the use of tobacco onsite was 3.9 (Std. Dev. 1.20). This resulted in an average score of 72.7%. No high items were reported in this section, as one standard deviation above (5.1) the overall average was greater than the maximum response of five. Additionally, one item ranked low in this section (1.0 - 2.7). Responses for senior centers' environmental strategies for referring their patrons to tobacco cessation resources were recorded as low. The summary of average environmental responses received for the tobacco section can be seen in Table 13.

Table 13. *Average Tobacco Environment Responses*

	Avg	Min	Max
Average Physical Activity Policy Score:	72.7%	60.0%	95.0%
Physical Activity Policy Response Average:	3.9*	2.4	5.0
Rank by Item			
5. Ban tobacco vending machine sales?	5.0	5.0	5.0
6. Ban tobacco promotions, promotional offers, and prizes?	5.0	5.0	5.0
7. Ban tobacco advertisement?	5.0	5.0	5.0
1. Institute a smoke-free policy 24/7 for indoor public places?	4.8	4.0	5.0
2. Institute a tobacco-free policy 24/7 for indoor public places?	3.6	1.0	5.0
3. Institute a smoke-free policy 24/7 for outdoor public places?	2.6	1.0	5.0
4. Institute a tobacco-free policy 24/7 for outdoor public places?	2.6	1.0	5.0
8. Implement a referral system to help patrons to access tobacco cessation resources and services, such as a quitline?	2.4	1.0	4.0

*Standard Deviation = 1.20

The aggregate average for senior center environments promoting chronic disease management was 4.1(Std. Dev. 0.49). This resulted in an average score of 79.0%. There were two high (4.6-5.0) items and one low (1.0 - 3.6) item for this section. High items included senior centers providing an onsite nurse and having an emergency plan in place. Senior centers' environmental responses were ranked low in providing access to chronic disease self – management programs. Despite this low categorization, senior center environments for providing access to chronic disease management programs scored fairly well (3.4). The averages of all the chronic disease management responses can be seen in Table 14.

Table 14. *Average Chronic Disease Management Environment Responses*

	Avg	Min	Max
Average Physical Activity Policy Score:	79.0%	55.0%	100.0%
Physical Activity Policy Response Average:	4.1*	3.4	4.8
Rank by Item			
8. Have an emergency response plan in place?	4.8	4.0	5.0
2. Provide access to an onsite nurse?	4.8	4.0	5.0
4. Provide routine screening, follow–up counseling and education to patrons to help address chronic diseases and related risk factors?	4.3	3.0	5.0
3. Provide an onsite medical clinic to monitor and address chronic diseases and related risk factors?	4.0	2.0	5.0
6. Adopt curricula or training to raise awareness of the importance of calling 9-1-1 immediately when someone is having a heart attack or stroke?	4.0	3.0	5.0
5. Adopt curricula or training to raise awareness of the signs and symptoms of heart attacks and strokes?	3.8	1.0	5.0
7. Promote chronic disease prevention to patrons?	3.8	2.0	5.0
1. Provide access to chronic disease self-management programs?	3.4	1.0	5.0

*Standard Deviation = 0.49

The cumulative average for senior centers' leadership environment promoting healthy lifestyles for the elderly was 3.6 (Std. Dev. 0.90). This resulted in an average score of 71.6%. Senior center responses were low (1.0 – 2.7) on one item, and high (4.5 – 5.0) on another. Rankings high on leadership environments promoting mission statements to include commitments to the well-being of patrons. Additionally, senior centers' responses ranked low on providing incentives for their patrons to participate in chronic disease prevention programs. Table 15 summarizes the averages found in this section of the CHANGE tool.

Table 15. *Average Leadership Environment Responses*

	Avg	Min	Max
Average Leadership Environment Score:	71.6%	50.0%	98.0%
Leadership Environment Response Average:	3.6*	1.8	5.0
Rank by Item			
6. Have a mission statement that includes the support of or commitment to patron health and well-being?	5.0	5.0	5.0
3. Have a wellness coordinator?	4.4	3.0	5.0
5. Have a health promotion budget?	4.0	1.0	5.0
10. Participate in community coalitions and partnerships to address chronic diseases and related risk factors?	4.0	2.0	5.0
9. Provide opportunities for patron feedback about health promotion programs?	3.8	2.0	5.0
8. Evaluate health promotion programs?	3.6	2.0	5.0
2. Participate in the public policy process to highlight the need for community changes to address chronic diseases and related risk factors?	3.3	1.0	5.0
4. Have a wellness committee?	3.0	1.0	5.0
7. Implement a needs assessment when planning a health promotion program?	3.0	1.0	5.0
1. Provide incentives to patrons participating in chronic disease prevention measures?	1.8	1.0	4.0

*Standard Deviation = 0.90

Discussion

The purpose of this research study was to evaluate how senior centers in Montgomery County use policy and environmental changes to promote healthy living in the elderly. Five senior centers were interviewed about physical activity, nutrition, tobacco, chronic disease management, and leadership. Policy and environmental scores were collected for each section.

Though the results showed there were areas that individual senior centers needed to improve, overall, the five senior centers surveyed were effectively promoting healthy lifestyles. For example, policies promoting the preparation of healthy foods and access to physical activity

programs were in place. Additionally, environmental initiatives such as providing access to free drinking fountains and onsite fitness centers were being implemented.

The five senior centers assessed performed equally well at policies (75.2%) and environments (74.7%) that promote healthy lifestyles for the elderly. The use of policy and environmental strategies in Montgomery County senior centers varies by CHANGE tool section. Senior centers were least likely to implement strategies to improve health from the nutrition and leadership sections of the CHANGE tool. This was true in both the policies adopted as well as in the senior center environments. Policy and environmental strategies were used most frequently within the chronic disease management, tobacco, and physical activity sections. Policy and environmental strategies in place at the five Montgomery County senior centers mirror the current efforts of the Centers for Disease Control and Prevention (CDC). The CDC named obesity and tobacco use in the ten focus areas for winnable battles. Obesity and tobacco use share a common link in that they both can cause chronic diseases (CDC, 2011b). The interviewed senior centers' focus on chronic disease management, physical activity and tobacco coincides with current public health efforts to battle obesity and tobacco use. The discussion below highlights the significant policy and environmental aspects of each section of the CHANGE tool.

Physical Activity

Senior centers are actively implementing policies that promote physical activity. The average score among senior centers for adopting physical activity policies was 76.4%. All five of the interviewed senior centers provide access to recreational facilities and offer physical activity classes and programs. Based on rankings received, policies to encourage the elderly to be physical active focus on enhancing access to indoor and outdoor recreational facilities. These

policies include designating walking paths, fitness centers, and gymnasiums. Physical activity programs include aerobics classes, walking clubs, sports teams, and tennis lessons. In addition to structured programs, policy scores also indicated that senior centers emphasize providing unstructured leisure time for activities such as tennis and table tennis. Policies initiated by all of the senior centers that provide access to recreational facilities and offer physical activity classes or programs are allowing the elderly to stay active.

Although senior centers provide access to recreational facilities and offer fitness classes, the interviewed sites do not promote stairwell use. Only one of the senior centers encourages stairwell use as part of their wellness policies for the elderly. The lack of policies in place to support stairwell use may be attributed to the physical limitations for senior center patrons. According to Fitzpatrick et al. (2008), if older adults cannot engage in the recommended amounts of physical activity due to health conditions, they should be as physically active as their abilities and conditions allow. Though some of the elderly patrons of senior centers may not be able to climb stairs, it is important for them to be physically active in accordance to their abilities.

The environments of interviewed senior centers in Montgomery County promote physical activity. The aggregate environmental score for the physical activity section of the CHANGE tool was 80.4%. This was the highest score received in the environmental sections. Providing a safe environment for patrons to be physically active is an area of focus for all interviewed sites. A review of the physical activity items shows that four out of the five facilities ranked providing patrons with a safe environment for physical activity including adequate lighting, security staff, and security cameras high. The wellness coordinator for the fifth senior center stated that “we are situated in a safe neighborhood”, indicating that there is no need for them to provide added

security measures. Many community programs focus on enhancing safety as a method of encouraging outdoor physical activity. Environmental safety barriers for walking and bike paths were removed in communities to promote healthier lifestyles in residents (City of Somerville, 2011; Curtatone & Economos, 2010; Louisville Metro Department of Public Health and Wellness, 2010). By providing safety measures for its constituents, interviewed senior centers in Montgomery County are promoting physical activity.

Environments for senior centers also focus on the transportation needs of their patrons. There are several environmental elements to support public transportation including bus stops and van pool services. Environmental elements such as being within walking distance of a bus stop are in place. Senior center administrators indicated that they have little control over the presence of bus stops near their facility. The presence of bus stops is attributed to local transportation policies. Bus stop locations are determined by the local transportation agency – RTA – to enhance access for Montgomery County residents. While some senior centers rely on public transportation, others provide their own shuttles for seniors. Implementations to facilitate transportation for seniors provide an opportunity for the elderly to be physically active within the safe and well-equipped environment of senior centers.

Nutrition

The interviewed senior centers are less likely to implement policies to promote nutrition. The aggregate nutrition policy score was 69.0 %. This was the second lowest policy score received. Four of the five interviewed senior centers do not have policies in place to promote healthy food options in vending machines. One of the interviewed sites does not allow onsite vending machines in order to adhere to their religious practices regarding food preparation. Senior centers have a policy in place to contract out their vending machines to third party

vendors. As a result, senior centers have less control over vending machine options. This policy to contract out to third party vendors results in a lack of an institutional policy to regulate vending machine options. In an effort to promote healthy nutrition for their patrons, senior centers can amend their policies to only contract with third party vendors that provide healthy food options in vending machines.

Policy scores for the promotion of nutritional labeling are among the lowest for interviewed senior centers. One of the five interviewed sites does not have a cafeteria. Three of the remaining four senior centers do not have institutional policies for nutritional labeling. Only one of the four sites has policies in place to provide nutritional labeling. Policies for providing general nutritional labeling such as 'low-fat' and 'fat-free' are implemented at this senior center. Policies to provide detailed nutrition information upon request are being enforced. This senior center is providing nutritional information in an effort to uphold religious beliefs regarding food preparation. Regardless of religious beliefs, this senior center can act as a model of nutritional labeling for the other three senior centers. Nutritional labeling represents a key policy strategy used by several community programs to encourage healthier eating. Programs are collaborating with local restaurants, for instance, to provide nutritional labels on menus. As a result, nutritional information is displayed on menus in restaurants in cities across the country (City of Somerville, 2011; Curtatone & Economos, 2010). By enacting policies that provide nutrition labeling, senior centers can help their patrons choose healthier food choices.

Despite the overall lack of policies, there are specific areas in which nutritional policies are being implemented. A key policy that Montgomery County senior centers implement helps ensure healthy portion sizes for their patrons. One of the five interviewed senior centers does not have a cafeteria onsite. Of the remaining four senior centers, three have policies in place to

control portion sizes. One of the senior centers has an institutional policy to follow Department of Health guidelines for portion sizes. Another senior center has an institutional policy in place to contract meal services out to third party vendors such as Meals on Wheels. This provides senior centers with little control over policies of outside vendors. However, the administrator for this senior center indicated that these third party vendors have their own organizational policies in place to provide pre-portioned meals. By implementing policies to restrict portion sizes, interviewed senior centers in Montgomery County are improving the nutritional health of their elderly patrons.

The interviewed senior centers lack environments to promote healthy nutrition for their patrons. The aggregate score for this section was 68.9%. This was the lowest aggregate environmental score obtained. The lack of environmental elements in place result from a lack of nutrition policies at interviewed sites. Since senior centers do not have policies to provide nutritional labeling, this leads to an environment where no nutritional labels are made available. Additionally, the lack of policies to regulate vending machine options leads to environments where unhealthy snacks and sugary beverages are available to patrons.

Despite the overall lack of environments to promote healthy nutrition, senior centers do provide nutritional environment elements in specific areas. Nutritional environments to provide safe, unflavored, cool drinking water at no cost to patrons are in place in all five senior centers. Environmental elements of functioning drinking fountains are present at all interviewed sites. By providing water fountains, senior centers are promoting healthier alternatives to sugary beverages.

Tobacco

Policies promoting tobacco cessation are being implemented at interviewed senior centers. The overall average score for tobacco policies was 77.4%, second only to chronic disease management. All five senior centers successfully implement policies to prohibit all forms of tobacco use indoors. One of the key factors for this policy implementation is the presence of Ohio state laws that prohibit smoking at indoor public places. While policies to prohibit the use of tobacco indoors are actively being implemented, policies prohibiting the use of smoking and non-smoking tobacco products outdoors need improvement. Senior centers are less likely to enforce policies creating tobacco-free zones at outdoor public places. Three out of the five interviewed sites do not have policies that actively prohibit the use of all forms of tobacco at outside public places. At one of the remaining two senior centers, there is a discrepancy between the administrators who believe all policies are being enforced, and seniors who observe otherwise. Multiple sites acknowledge the Ohio state law instituting smoke-free perimeters around their property, but there is a lack of enforcement at the organizational level. Participants at two of the interviewed senior centers stated that they rely on local police and government officials to enforce state laws for outside public places. This 'pass the buck' type of approach contradicts policies that are being enforced at multiple organizations throughout the United States. Organizations such as hospitals are actively enforcing policies to create an environment of smoke-free campuses (Williams et al., 2009). By enforcing policies to prohibit smoking at outdoor public places, senior centers can further improve their tobacco cessation efforts.

Policies promoting the referral of patrons to tobacco cessation resources are not actively being implemented at interviewed sites. Four out of the five senior centers lack policies that

promote the referral of patrons to tobacco cessation resources. One of the senior centers indicated that such a referral system was not applicable to their mission statement. Though senior centers' policies do not promote the referral of patrons to tobacco cessation services, policies to refer employees to resources such as a quit-line are actively being implemented. The referral policies in place for employees can be expanded to promote tobacco abstinence in the patrons.

The implementation of senior center policies to restrict tobacco use is instrumental in creating environments where tobacco use is prohibited. The overall environmental score for tobacco cessation was 72.7%. This was the third highest environmental score recorded. Senior center environments successfully establish smoke-free zones at indoor public places. All five senior center environments prohibit smoking indoors. Smoke-free environments are instituted by posting signs at all entrances of the facilities. The implementation of policies in accordance to Ohio state laws is crucial to creating indoor smoke-free environments.

Though smoke-free environments are in place, senior center environments are less successful at prohibiting the use of non-smoking forms of tobacco indoors. Three of the five interviewed sites do not have environmental elements in place to specifically prohibit the use of non-smoking forms of tobacco indoors. As a result, senior center environments do not reflect the successful implementation of polices that prohibit non-smoking tobacco use at indoor public places. This lack of environments to restrict the use of non-smoking forms of tobacco indoors is congruent to the Ohio smoking ban that does not restrict non-smoking forms of tobacco (Ohio Department of Health, 2006). Interviewed senior centers are therefore following the minimum legal standards in their implementation of tobacco environments. The disconnect between policy

and environment for this item can be addressed by environmental elements such as posting signs that remind patrons to abstain from all forms of tobacco.

Senior center environments do not actively prohibit the use of tobacco products at outdoor public places. Four out of five interviewed senior centers lack environmental elements to prohibit tobacco use outdoors. This lack of environments is due to a lack of policies that restrict tobacco use outdoors.

Despite the lack of policies to refer patrons to tobacco cessation services, some environmental elements are in place at three out of the five senior centers. Senior center administrators indicated the presence of flyers referring patrons to third-party smoking cessation resources in the community. Although these administrators did not place the flyers, they do allow third-party smoking cessation resources to reach out to their constituents. The presence of these flyers creates an environment that promotes smoking cessation for the elderly patrons regardless of the lack of active polices.

Chronic Disease Management

The interviewed senior centers are effectively implementing policies to address chronic disease management for their constituents. Among policies promoting healthy lifestyles for the elderly, chronic disease management policies received the highest percentage score. The aggregate score for policies promoting chronic disease management was 86.0%. One of the five senior centers does not include chronic disease management as part of their mission statement. As a result, they responded ‘not applicable’ to chronic disease management questions. The remaining four senior centers have policies in place to address chronic disease management through educational programming and screenings. The management of chronic diseases represents a key factor in the health and well-being of the elderly. According to Agency for

Healthcare Research and Quality, 75 percent of the elderly suffer from at least one chronic condition. Additionally, approximately 50 percent of the elderly have two chronic illnesses (AHRQ, 2002). Preventing and managing chronic diseases before they become debilitating represents an important focus of many American public health efforts (Glanz, Rimer, & Lewis, 2002). Through their policies, the five interviewed senior centers in Montgomery County are successfully addressing the chronic disease management needs of their patrons.

The implementation of these policies created environments that actively promote chronic disease management. The aggregate environmental score for the chronic disease management section was 79.0%, second only to physical activity. Three of the four responding senior centers are implementing environments such as educational programming and chronic disease screenings at their facility. Environmental educational programming includes counseling programs, guest speakers such as physicians and nurses, and disease-specific programs focusing on diabetes, Parkinson's disease, and sleep apnea. In conjunction with these educational programs, environments that provide screenings are successfully implemented at the four senior centers that responded. These facilities address screening by regularly providing nurses onsite. These nurses conduct screenings through clinics for chronic diseases such as hypertension, high cholesterol, and diabetes. Environments at interviewed senior centers in Montgomery County are successfully helping elderly patrons manage chronic diseases.

Leadership

Policies that provide leadership to promote healthy living for the elderly are used less frequently at interviewed sites. The aggregate score for adopting leadership policies was 67.3%. This was the lowest policy score obtained. Policies for incentivizing participation of seniors in chronic disease prevention programs are lacking at interviewed sites. One of the senior centers

answered ‘not applicable’ to this item, as they do not include chronic disease management as part of their mission statement. Three of the remaining four senior centers indicated that they do not have policies in place to incentivize their patrons. Two of the senior centers voiced concerns regarding providing incentives for participation. They stated that providing incentives for chronic disease prevention programs could act as a barrier for those patrons who cannot participate or compete. For example, providing incentives for walking programs would create barriers for patrons with disabilities.

The interviewed senior centers are lacking in policies for forming a wellness committee. One of the senior centers stated that since a wellness committee is provided at the city level, this item is not applicable to their organization. Three of the remaining four senior centers do not have a wellness committee in place. By implementing leadership policies to provide a wellness committee, senior centers can further enhance their efforts to promote healthy lifestyles for the elderly.

Policies for providing a full-time wellness coordinator onsite are less frequently used at interviewed senior centers. Senior centers’ abilities to implement leadership policies are limited by their funding. One of the senior center administrators indicated that they lacked funding to employ a full-time wellness coordinator. Only two of the five senior centers can afford full-time wellness coordinators. The remaining senior centers delegate the responsibilities of a wellness coordinator to multiple staff members.

Despite the low aggregate policy score, interviewed senior centers implement several policies that promote leadership. Policies for providing a health promotion budget are being implemented at four of the five interviewed senior centers. Additionally, all five of the senior centers have mission statements that affirm their commitment to health and well-being of their

patrons. By having a mission statement and earmarking a health promotion budget to help promote the health and well-being of patrons, senior centers are efficiently utilizing their limited resources.

Due to this lack of policy implementation, interviewed sites have few leadership environments in place. The aggregate score for leadership environments was 71.6%. This was the second lowest environmental score. The lack of policies that incentivize patrons to participate in chronic disease prevention programs is reflected by the shortage of environmental elements for this item. Environments at three of the four responding senior centers do not provide incentives for participation in chronic disease management programs. This lack of environments is again a conscious effort by senior centers to avoid placing barriers for those seniors that cannot participate. As discussed in the physical activity section, senior centers help encourage their patrons to be as involved as their abilities allow. Environments that provide incentives for participation in physical activity programs for chronic disease management may act as a barrier to patrons who suffer from disabilities. As a result, this leadership environment item was less likely to be applied by senior centers.

Despite the overall lack of leadership environments, senior centers' policy to have a health promotion budget helped create environmental elements. Environmental elements such as wellness centers and health promotion programming were present at three of the five interviewed sites. These environments were created as a result of senior centers' health promotion budget policy. By providing further leadership environments to improve the health of their patrons, senior centers can lead the way to elderly well-being.

Findings for all Montgomery County Senior Centers

A similar study assessing nine senior centers in Montgomery County was conducted by Gardner in 2012. This study used the CHANGE tool to assess the remaining eight senior centers in Montgomery County. The overall environmental scores found by Gardner were comparable to the ones found in this study. Additionally, Gardner found lower policy scores for all five sections of the CHANGE tool. Between Gardner 2012 and this study, 13 senior centers within Montgomery County were assessed. Weighted averages for overall policy and environmental scores were calculated. These weighted averages represent how senior centers in Montgomery County performed. The weighted averages for policy and environmental scores are detailed in Appendix G.

Montgomery County Senior centers are more likely to implement healthy lifestyle environments than wellness policies. The weighted environmental score of 74.9% was received. Environmental scores were substantially higher (9.7%) than the overall policy score of 65.2%. Area senior centers successfully implement environments for promoting the health and well-being of the elderly. Environments promote healthy living through encouraging physical activity, promoting healthy nutrition, prohibiting tobacco use, emphasizing chronic disease management, and providing leadership to promote healthy lifestyles.

Montgomery County senior centers excel at implementing environments that encourage physical activity, prohibit tobacco use, and promote chronic disease management. Physical activity environmental elements such as aerobics classes, walking clubs, and fitness rooms are available at all senior centers. The implementation of tobacco policies in accordance to the Ohio state laws shapes environmental elements that prohibit smoking tobacco products at indoor public places. These elements include posting non-smoking signs at all entrances of senior

centers. Furthermore, environments promoting chronic disease management are in place at eleven of the thirteen senior centers in Montgomery County. These senior centers actively promote management of chronic diseases through educational programming and chronic disease screenings at their facilities.

Senior centers in Montgomery County less frequently implement policies to promote healthy lifestyles. Policies promoting healthy nutrition for Montgomery County senior centers are less likely to be implemented. Montgomery County senior centers received the lowest weighted score of 61.0% for their nutritional policies. The majority of senior centers lack institutional nutritional policies because they rely on third party vendors such as Meals on Wheels to provide food for the elderly. Senior centers have less control over the policies of these third parties. By implementing policies that build coalitions with community resources such as farmers' markets, senior centers can help better meet the nutritional needs of their elderly patrons.

Montgomery County senior centers are less likely to implement policies that encourage leadership to promote healthy lifestyles. Deficiency in leadership policies is attributed to the lack of wellness coordinators and wellness committees. Only two of the senior centers in Montgomery County have designated full-time wellness coordinators in place. The responsibilities of wellness coordinators are generally delegated to multiple staff members. Additionally, only one senior center has a wellness committee in place. The lack of full-time wellness coordinators and committees is due to the limited funding available to senior centers. Senior centers can seek out additional sources of funding such as community sponsors and grants to designate full-time wellness coordinators.

Despite the lack of policies promoting healthy lifestyles, senior centers in Montgomery County successfully implemented tobacco policies. The implementation of tobacco policies is accordance to the Ohio state laws that prohibit smoking of tobacco products at public places. Additionally, tobacco control has been at the center of public health efforts to prevent chronic diseases. Tobacco control policies can act as a model to promote health and well-being in other facets of elderly living such as healthy nutrition and physical activity.

Using the CHANGE tool for Senior Centers

Senior centers can benefit in multiple ways as a result of this study. The application of the CHANGE tool can help senior centers gain a better understanding of their strengths and weaknesses in comparison to other sites in Montgomery County. In some cases, the questions in this tool helped senior center administrators recognize which sections of the CHANGE tool needed to be developed further. During the interview process, one of the administrators predicted that they will perform well in the nutrition section, however, they needed more programming initiatives in the physical activities section. Additionally, since the interviewed senior centers do not compete with each other, they can reach out and form coalitions to better promote healthy lifestyles for the elderly.

One unforeseen benefit of the CHANGE tool was the dialogue that it created regarding healthy lifestyle programming for seniors. Questions posed by the CHANGE tool helped provide ideas for senior center administrators on the areas that they can better apply their efforts. Overall, the ‘outsider’s perspective’ that was brought by the CHANGE tool helped stimulate critical thinking and the generation of new ideas regarding senior programming.

Though the CHANGE tool can be effective in assessing health related needs and assets in a community, it does have multiple limitations. The CHANGE tool can help identify the current

policies and environments that are being implemented in a community. However, it does not account for participation in programs that are created as a result of implementation of these policies and environments. As a result, the CHANGE tool was unable to account for the effectiveness of Montgomery County senior center assets that are in place.

Another limitation of the CHANGE tool was observed during the data analysis. The data analysis of the CHANGE tool was based on averages and standard deviations. High categories were defined as being greater than one standard deviation higher than the average. Low categories were defined as being greater than on standard deviation lower than the average. If the average of an item was greater than 4.0, the data analysis of CHANGE tool did not allow for the average of that item to be categorized as high. As a result, some items were recorded as average, even though the policies and environments for that item were fully being implemented by all five senior centers.

Limitations of the Study

Multiple limitations were identified in this study. This study examined only five senior centers in Montgomery County. Due to a small sample size, the data from this study could not be generalized to other senior centers. The small sample size also makes this study susceptible to response bias. As there were only five senior centers, bias from one senior center could significantly skew the data obtained.

Public Health Implications

Schools serve as venues to promote healthy lifestyles for children. School districts are promoting physical activity in children through curriculum changes and increased recess times in an effort to encourage healthy behaviors in this population (Louisville Metro Department of Public Health and Wellness, 2010). School districts in Omaha are promoting healthy nutrition

by initiating farm-to-school programs (Douglas County, 2011). Worksites serve as venues to promote healthy living in adults. National companies are creating walking teams, fitness challenges, and allotting time during the work week to encourage their employees to exercise (Levi, Segal, St. Laurent & Kohn, 2011). Worksites in Monterey County, California have implemented healthy meeting policies which discourage their employees from bringing high fat, high calorie foods such as doughnuts, muffins, and cookies to office meetings (Ruano, 2011).

Similarly, senior centers serve as focal points for elderly resources. Senior centers have great potential to improve the health of the elderly. Programs developed for the child and adult populations can be adopted to fit the needs of the elderly. Through policy and environmental implementations, public health officials, including senior center administrators can improve the quality of life for the elderly. The implementations of policies and environments that encourage healthy living will help ease the public health burden of managing the health of an aging population.

There are many opportunities for senior centers to increase the scope of their effect on the elderly. Senior centers can increase their community outreach to the elderly in their neighborhoods. Simultaneously, senior centers can expand their existing facilities to accommodate for a larger target population. Senior centers can better utilize staff members in the development and implementation of wellness programs. Public health officials, local and state governments can capitalize on these essential community resources. The limited resources that are available to senior centers represent a barrier in their ability to reach their full potential. By increasing funding for senior centers, public health administrators can help establish and expand wellness programs for seniors. In doing so, local public health will be taking advantage

of an already existing resource for seniors in their community. This will help improve the health outcomes of elderly in their jurisdictions.

Future Research

Though data was collected on the policies and environmental initiatives that are offered by senior centers, the effectiveness of these programs was not determined. Future studies could aim to address parameters such as participation in the programs offered by senior centers. Data on participation could help senior centers identify specific programs that need improvement.

References

AHRQ. (2002). *Preventing Disability in the Elderly with Chronic Disease.* Retrieved September 02, 2011, from http://www.ahrq.gov/research/elderdis.pdf

AHRQ. (2006). *The high concentration of U.S. health care expenditures*. Retrieved October 14, 2011, from http://www.ahrq.gov/research/ria19/expendria.htm

Allegheny Valley YMCA. (2011). *The Allegheny Valley YMCA*. Retrieved October 15, 2011, from Senior Programming: http://www.avymca.org/seniors.html

Allman-Farinelli, M. A. (2009). Do Calorically Sweetened Soft Drinks Contribute to Obesity and Metabolic Disease? *Nutrition Today*, *44*(1), 17- 20.

The American Cancer Society. (2011). *Great American smokeout*. Retrieved October 29, 2011, from Stay Healthy: Healthy Living Information to Help You Stay Well: http://www.cancer.org/Healthy/StayAwayfromTobacco/GreatAmericanSmokeout/index

American College of Sports Medicine and American Diabetes Association. (2010). Exercise and Type 2 Diabetes. *Medicine & Science in Sports & Exercise*, 2282-2303.

Anderson, B., Rafferty, A. P., Lyon-Callo, S., Fussman, C., & Imes, G. (2011). Fast-food consumption and obesity among michigan adults. *Preventing Chronic Disease: Public Health Research, Practice, and Policy*, *8*(4), A71.

Bandura, A. (2005). The primacy of self-regulation in health promotion. *Applied Psychology: An InternationalL Review*, *54*(2), 245-254.

Brown, D., Rabiner, D., Wiener, J., & Gage, B. (2006). *Case studies of health promotion in the aging network: Senior resource alliance: The Area Agency on Aging on Central Florida.* RTI International.

California Center for Public Health Advocacy. (2009, November). *Sugar-Sweetened Beverages: Extra Sugar, Extra Calories, and Extra Weight.* Retrieved August 31, 2011, from http://www.cdph.ca.gov/programs/wicworks/Documents/RethinkYourDrink/WIC-RethinkYourDrink-SugarSweetenedBeveragesCACPHA.pdf

California Department of Public Health. (2011). *Social Ecological Model.* Retrieved January 03, 2012, from http://www.cdph.ca.gov/programs/cpns/Documents/Network-Appendix6SocialEcologicalModel.pdf

Campaign for Tobacco Free Kids. (2011). *State Cigarette Excise Tax Rates & Rankings.* Washington, D.C.: tobaccofreekids.org.

CDC. (2003). *Public Health and Aging: Trends in Aging --- United States and Worldwide*. Retrieved January 03, 2012, from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5206a2.htm

CDC. (2009a). *Youth behaioral risk factor surveillance system survey (YBRFSS) prevalence and trend data: Tobacco use.* Atlanta, Georgia: U.S. Department of Health and Human Services.

CDC. (2009b). *Behavioral risk factor surveillance survey (BRFSS) prevalence and trend data: Tobacco use.* Atlanta, Georgia: U.S. Department of Health and Human Services.

CDC. (2009c). *Behavioral risk factor surveillance system survey (BRFSS) data prevalence and trend data: Physical activity.* Atlanta, Georgia: U.S. Department of Health and Human Services.

CDC. (2009d). *Youth behavioral risk factor surveillance survey (YBRFSS) prevelance and trend data: Physical activity.* Atlanta, Georgia: U.S. Department of Health and Human Services.

CDC Healthy Communities Program. (2010). *Community Health Assessment and Group Evaluation (CHANGE).* Retrieved 11 02, 2011, from http://www.cdc.gov/healthycommunitiesprogram/tools/change/pdf/changeactionguide.pdf

CDC. (2010a). State-specific prevalence of cigarette smoking and smokeless tobacco use among adults --- United States, 2009. *Morbidity and Mortality Weekly Report , 59* (43), 1400-1406.

CDC. (2010b). State-specific trends in fruit and vegetable consumption among adults --- United States, 2000--2009. *Mobidity and Mortality Weekly Report (MMWR) , 59* (35), 1125-1130.

CDC. (2010c). State cigarette excise taxes--2009. *Morbidity and Mortality Weekly Report (MMWR) , 59* (13), 385-388.

CDC. (2010d). State preemption of local smoke-free laws in government work sites, private work sites, and restaurants --- United States, 2005--2009. *Morbidity and Mortality Weekly Report (MMWR) , 59* (4), 105-108.

CDC CHANGE. (2011). *Download the Community Health Assessment and Group Evaluation (CHANGE) Action Guide*. Retrieved 11 06, 2011, from http://www.cdc.gov/healthycommunitiesprogram/tools/change/downloads.htm

CDC. (2011a). *Winnable battles*. Retrieved October 8, 2011, from CDC Home: http://www.cdc.gov/WinnableBattles/index.html

CDC. (2011b). *Nutrition, physical activity, and obesity*. Retrieved October 9, 2011, from CDC Winnable Battles Home: http://www.cdc.gov/WinnableBattles/Obesity/index.html

CDC. (2011c). *Tobacco use*. Retrieved October 25, 2011, from Winnable Battles: http://www.cdc.gov/WinnableBattles/Tobacco/index.html

CDC. (2011d). *Physical activity for everyone: how much physical activity do adults need?* Retrieved July 19, 2011, from Centers for Disease Control and Prevention: http://www.cdc.gov/physicalactivity/everyone/guidelines/adults.html

CDC. (2011e). *Target heart rate and estimated maximum heart rate*. Retrieved October 22, 2011, from Physical Activity for Everyone: http://www.cdc.gov/physicalactivity/everyone/measuring/heartrate.html

CDC. (2011f). *Social Ecological Model*. Retrieved 10 14, 2011, from http://www.cdc.gov/cancer/crccp/sem.htm

CDC. (2011g). *Smoke-Free Policies Reduce Smoking*. Retrieved October 20, 2011, from Smoking and Tobacco Use: http://www.cdc.gov/tobacco/data_statistics/fact_sheets/secondhand_smoke/protection/reduce_smoking/index.htm

CDC. (2011h). *Smokeless Tobacco Facts*. Retrieved November 29, 2011, from http://www.cdc.gov/tobacco/data_statistics/fact_sheets/smokeless/smokeless_facts/

CDC. (2011i). *Physical Activity and Health*. Retrieved 12 06, 2011, from http://www.cdc.gov/physicalactivity/everyone/health/index.html#ReduceCardiovascularDisease

CDC. (2012). *Designing and Building Healthy Places*. Retrieved January 03, 2012, from http://www.cdc.gov/healthyplaces/

Center for Nutrition Policy and Promotion. (2011). *Dietary guidelines for americans.* Retrieved August 31, 2011, from http://www.cnpp.usda.gov/dgas2010-policydocument.htm

Center for Nutrition Policy and Promotion. (2002). *How much are you eating? Dietary guidelines for americans.* USDA.

City of Somerville. (2011). *Somerville, MA*. Retrieved July 12 2011, 2011, from Shape Up Somerville: http://www.somervillema.gov/departments/health/sus

Curtatone, C. D., & Economos, J. A. (2010). Shaping up Somerville: A community initiative in Massachusetts. *Preventive Medicine, 50*, 97-98.

Dayton Montgomery County & Visitors Bureau. (2008). *About Dayton*. Retrieved November 4, 2011, from Dayton Ohio: http://www.daytoncvb.com/about-dayton/

Douglas County. (2011). *Douglas county putting prevention to work: Live well Omaha*. Retrieved July 7, 2011, from Making the Healthy Choice the Easy Choice: http://www.livewellomaha.org/

Economics and Statistics Administration. (2005, 12). *65+ in the United States: 2005.* Retrieved November 02, 2011, from http://www.census.gov/prod/2006pubs/p23-209.pdf

Fitzpatrick, S. E., Reddy, S., Lommel, T. S., Fischer, J. G., Speer, E. M., Stephens, H., et al. (2008). Physical activity and physical function improved following a community-based intervention in older adults in Georgia senior centers. *Journal of Nutrition for the Elderly*, 135-154.

The Food Trust. (2004). *Farmers Market Program*. Retrieved July 15, 2011, from The Food Trust: http://www.thefoodtrust.org/php/programs/farmers.market.program.php

Frederick County Government. (2011). *Senior Centers and Nutrition Site*. Retrieved October 15, 2011, from Frederick County, Maryland: http://www.frederickcountymd.gov/index.aspx?NID=158

French, S. A., Story, M., Fulkerson, J. A., & Hannan, P. (2004). An environmental intervention to promote lower-fat food choices in secondary schools: Outcomes of the TACOS study. *American Journal of Public Health*, 1507-1512.

Gardner, S. (2012). Health Enhancing Policies and Environments in Select Montgomery County Senior Centers. Dayton, Ohio.

Gitelson, R., Ho, C.-h., Fitzpatrick, T., Case, A., & McCabe, J. (2008). The impact of senior centers on participants in congregate meal programs. *Journal of Park and Recreation Administration*, 136-151.

Glanz, K., Rimer, B. K., & Lewis, F. M. (2002). *Health Behavior and Health Education.* San Francisco: Jossey - Bass.

Hall, M. (2009). Mass. town takes steps to trim fat (really), health care costs. *USA Today, April 20, 2009*.

Hancock, C., & Cooper, K. (2011). A global initiative to tackle chronic disease by changing lifestyles. *Primary Healthcare*, 24-26.

Healthways Silver Sneakers Program. (2011). *What is the silver sneakers fitness program?* Retrieved October 3, 2011, from SilverSneakers: http://silversneakers.com/TellMeEverything/WhatisSilverSneakers.aspx

Hochman, S. R., & Kernan, W. (2007). *A Social-Ecological Model for Addressing Stress on the College Campus.* Retrieved December 06, 2011, from http://health.columbia.edu/files/healthservices/alice_SocEcoStress_ACHA_2010.pdf

Jackson, R. J., & Kochtitzky, C. (2001). Creating a healthy environment: The impact of built environment on public health. *Sprawl Watch Clearinghouse Monograph Series* .

Jonnalagadda, S. S., Harnack, L., Liu, R. H., McKeown, N., Seal, C., Liu, S., et al. (2011). Putting the Whole Grain Puzzle Together: Health Benefits Associated with Whole Grains—Summary of American Society for Nutrition 2010 Satellite Symposium. *The Journal of Nutrition*, 1011-1022.

Joyce, G. F., Niaura, R., Maglione, M., Mongoven, J., Larson-Rotter, C., Coan, J., et al. (2008). The effectiveness of covering smoking cessation services for medicare beneficiaries. *Health Services Research*, 2106-2123.

Let's Go Maine. (2011). *It's working--5210 everyday*. Retrieved June 26, 2011, from 5210 Let's Go: http://www.letsgo.org/index.php

Let's Move. (2011). *Learn the facts*. Retrieved Oct 22, 2011, from Let's Move! America's Move to Raise a Healthier Generation of Kids: http://www.letsmove.gov/learn-facts/epidemic-childhood-obesity

Levi, J., Segal, L. M., St. Laurent, R., & Kohn, D. (2011). *F as in fat 2011: How obesity threatens america's future.* Washington, D.C.: Robert Wood Johnson Foundation.

Louisville Metro Department of Public Health and Wellness. (2010). *Louisville putting prevention to work: Mayors healthy hometown movement. Community action plan.* Louisvlle, Kentucky: Louisville Metro Department of Public Health and Wellness.

My Plate. (2011). *Food Groups*. Retrieved December 11, 2011, from http://www.choosemyplate.gov/foodgroups/grains_counts_table.html

MyPlate. (2011a). *Dietary guidelines 2010 selected messages for consumers.* MyPlate.

MyPlate. (2011b). *ChooseMyPlate.gov*. Retrieved August 26th, 2011, from http://www.choosemyplate.gov/

National Prevention Council. (2011). *National prevention strategy: Americas plan for better health and wellness.* Washington, D.C.: U.S. Department of Health and Human Services.

The Nemours Corporation. (2011). *5-2-1-almost none*. Retrieved July 11, 2011, from Nemours. A Childrens Health System: http://www.nemours.org/service/preventive/nhps/521an.html

Nicita-Mauro, V., Maltese, G., Nicita-Mauro, C., Lasco, A., & Basile, G. (2010). Non smoking for successful aging: Therapeutic perspectives. *Current Pharmaceutical Design*, 775-782.

Ohio Department of Aging. (2011). *Ohio Department of Aging Senior Centers*. Retrieved December 11, 2011, from http://aging.ohio.gov/resources/seniorcenters/

Ohio Department of Health. (2006). *Ohio Smoking Law Summary*. Retrieved May 27, 2012, from http://www.odh.ohio.gov/~/media/ODH/ASSETS/Files/behsmoke%20free%20enforcement/ohiosmokinglawsummary.ashx

Ossad, J. (2011). *New York City outdoor smoking ban begins.* Atlanta: Cable News Network (CNN).

Owen, A., Wiles, J., & Swaine, I. (2010). Effect of isometric exercise on resting blood pressure: a meta analysis. *Journal of Human Hypertension*, 796-800.

Pfizer Incorporated. (2011). *12 weeks of chantix: One full year of support*. Retrieved October 30, 2011, from The Get-Quit-Plan: https://www.get-quit.com/sites/getquit/Pages/index.aspx

Ruano, E. (2011). *Why wellness?* Montery, California: Montery County Health Department.

Sallis, J. F., & Owen, N. (2002). Ecological models of health behavior. In K. Glanz, B. K. Rimer, & F. M. Lewis, *Health Behavior and Health Education: Theory, Research, and Practice, 3rd ed.* (pp. 462-484). San Francisco, CA: Jossey-Bass.

Sallis, J. F., Bauman, A., & Pratt, M. (1998). Environmental and policy interventions to promote physical activity. *American Journal of Preventative Medicine, 15*(4), 379-397.

Shrestha, L. B. (2006). *CRS report for Congress - Life expectancy in the United States.* Congressional Research Service - The Library of Congress.

Smith, T. A., Lin, B.-H., & Lee, J.-Y. (2010). *Taxing Caloric Sweetened Beverages Potential Effects on Beverage Consumption, Caloric Intake, and Obesity.* U.S. Department of Agriculture, Economic Research Service.

Social Security Administration. (2010). *Income of the aged chartbook, 2008.* Washington, D.C.: Social Security Administration.

Tobacco Prevention Networks. (2009). *Forms of tobacco*. Retrieved October 30, 2011, from National Networks for Tobacco Control and Prevention: http://www.tobaccopreventionnetworks.org/site/c.ksJPKXPFJpH/b.2604771/k.A2C6/Forms_of_Tobacco.htm

U.S. Census Bureau. (2010). *The older population in the United States: 2010.* Retrieved 09 02, 2011, from http://www.census.gov/population/www/socdemo/age/older_2010.html

U.S. Census Bureau. (2011). *Montgomery County, Ohio*. Retrieved November 4, 2011, from State & County Quickfacts: http://quickfacts.census.gov/qfd/states/39/39113.html

U.S. Department of Health and Human Services. (2008). *At-a-glance: A fact sheet for professionals*. Retrieved October 28, 2011, from Physical Activity Guidelines for Americans: http://www.health.gov/paguidelines/factsheetprof.aspx

University of Pittsburgh Medical Center. (2007). Yes, UPMC will be smoke free. *EXTRA: News and Information for UPMC staff, 11, 18*. Pittsburgh, Pennsylvania: UPMC Internal Communications.

USDA. (2008a). *Frequently asked questions*. Retrieved October 21, 2011, from Physical Activity for Everyone: http://www.health.gov/paguidelines/faqs.aspx#Question2

USDA Food and Nutrition Service. (2011). *Senior Farmers' Market Nutrition Program.* Retrieved January 03, 2012, from http://www.fns.usda.gov/wic/SFMNP-Fact-Sheet.pdf

USDA. (2011a). *Protein foods*. Retrieved August 31, 2011, from Food Groups: http://www.choosemyplate.gov/foodgroups/proteinfoods.html

USDA. (2011b). *Dairy*. Retrieved August 31, 2011, from Food Groups: http://www.choosemyplate.gov/foodgroups/dairy.html

USDA. (2011c). *Empty calories*. Retrieved Aug 31, 2011, from http://www.choosemyplate.gov/foodgroups/emptycalories_sugars.html

USDA. (2011d). *Development of 2010 dietary guidelines for americans consumer messages and new food icon.* United States Department of Agriculture.

USDA. (2011e). *Protein Foods*. Retrieved January 01, 2012, from http://www.choosemyplate.gov/food-groups/protein-foods-why.html

Vandalia Senior Center. (2011). *Vandalia Senior Center.* Retrieved December 08, 2011, from http://www.ci.vandalia.oh.us/senior_center.cfm

Washington State Department of Health. (2011). *Models, factors, and theories in change*. Retrieved October 27, 2011, from Partners in Action: Good Nutrition, Active Living, & Healthy Communities in Washington: http://depts.washington.edu/waaction/plan/append/a.html

WHO. (2004). *Fruit and vegetables for health: Report of a joint FAO & WHO workshop.* Kobe, Japan: World Health Organization & Food and Agriculture Organization of the United Nations.

WHO. (2011). *Definition of Health*. Retrieved November 27, 2011, from http://www.who.int/suggestions/faq/en/index.html

WHO. (2011a). *Physical Activity and Older Adults*. Retrieved October 29, 2011, from Global Strategy on Diet, Physical Activity, and Health: http://www.who.int/dietphysicalactivity/factsheet_olderadults/en/index.html

WHO. (2011b). *Definition of an older or elderly person*. Retrieved September 02, 2011, from World Health Organization: http://www.who.int/healthinfo/survey/ageingdefnolder/en/index.html

Williams, S. C., Hafner, J. M., Morton, D. J., Holm, A. L., Milberger, S. M., Koss, R. G., et al. (2009). The adoption of smoke-free hospital campuses in the united states. *Tobacco Control, 18*, 451-458.

Young, L. R., & Nestle, M. (2002). The contribution of expanding portion sizes to the US obesity epidemic. *American Journal of Public Health, 92*(2), 246-249.

Ziegelmann, J. C., & Lippke, S. (2007). Planning and strategy use in health behavior change: a life span view. *International Journal of Behavioral Medicine, 14*(1), 30-39.

Appendix A – CHANGE Tool (CDC CHANGE, 2011)

Demographic

1. Best description of the community setting: rural, suburban, urban
2. Median household income in the community: < $25,000, $25,000 – $34,999, $35,000 – $49,999, $50,000 – $74,999, ≥ $75,000
3. Sector type: private, public
4. Profit type: for-profit, not-for-profit
5. Target population: children/youth* (ages: <18), adults (ages: 18-64), seniors/older adults (ages: 65+), other. *If serving children/youth, what grades are being served: preschool, elementary school, middle school, high school
6. Type of institution/organization: senior center, faith-based organization, daycare center, boys and girls club, health and wellness center, university/college, other

Physical Activity

To what extent does the community institution/organization:

1. Promote stairwell use (e.g., make stairs appealing, post motivational signs near stairs to encourage physical activity)?
2. Provide a safe area outside (e.g., through lighting, signage, crime watch) to walk or be physically active?
3. Designate a walking path on or near building property?
4. Encourage non-motorized commutes (e.g., active transportation such as walk or bike) to the facility?
5. Enhance access to public transportation (e.g., bus stops, light rail stops, van pool services, subway stations) within reasonable walking distance?
6. Provide access to onsite fitness center, gymnasium, or physical activity classes?
7. Provide a changing room or locker room with showers?
8. Provide bicycle parking (e.g., bike rack, shelter) for patrons?
9. Provide access to a broad range of competitive and noncompetitive physical activities that help to develop the skills needed to participate in lifetime physical activities?
10. Provide opportunity for unstructured play or leisure-time physical activity?
11. Prohibit using physical activity as a punishment?
12. Restrict screen time to less than 2 hours per day for children over 2 years of age?
13. Provide direct support (e.g., money, land, pavilion, recreational facilities, sponsorship, advertising) for supporting community-wide physical activity opportunities (e.g., sports teams, walking clubs)?

Nutrition

To what extent does the community institution/organization

1. Institute healthy food and beverage options in vending machines?
2. Institute healthy food and beverage options at institution-sponsored meetings and events?
3. Institute healthy food and beverage options in onsite cafeteria and food venues?
4. Institute healthy food purchasing (e.g., to reduce the caloric, sodium, and fat content of foods offered) for cafeteria and onsite food venues?
5. Institute healthy food preparation practices (e.g., steaming, low fat, low salt, limiting frying) in onsite cafeteria and food venues?
6. Institute pricing strategies that encourage the purchase of healthy food and beverage options?

7. Ban marketing (e.g. counter advertisements, posters, other print materials) of less than healthy foods and beverages onsite?
8. Provide smaller portion sizes in onsite cafeteria and food venues?
9. Institute nutritional labeling (e.g., 'low fat,' 'light,' 'heart healthy,' 'no trans fat') at onsite cafeteria and food venues?
10. Provide safe, unflavored, cool drinking water at no cost to patrons?
11. Prohibit using food as a reward or punishment?
12. Provide direct support (e.g., money, land, pavilion, sponsorship, advertising) for supporting community-wide nutrition opportunities (e.g., farmers' markets, community gardens)?
13. Provide a comfortable, private space for women to nurse or pump to support and encourage patrons' ability to breastfeed?

Tobacco

To what extent does the community institution/organization:

1. Institute a smoke-free policy 24/7 for indoor public places?
2. Institute a tobacco-free policy 24/7 for indoor public places?
3. Institute a smoke-free policy 24/7 for outdoor public places?
4. Institute a tobacco-free policy 24/7 for outdoor public places?
5. Ban tobacco vending machine sales (including self-service displays)?
6. Ban tobacco promotions, promotional offers, and prizes?
7. Ban tobacco advertisement (e.g., restrict point-of-purchase advertising or product placement)?
8. Implement a referral system to help patrons to access tobacco cessation resources and services, such as a quitline (e.g., 1-800-QUIT-NOW)?

Chronic Disease Management

To what extent does the community institution/organization:

1. Provide access to chronic disease self-management programs (e.g., Weight Watchers for overweight/obesity)?
2. Provide access to an onsite nurse?
3. Provide an onsite medical clinic to monitor and address chronic diseases and related risk factors (e.g., high blood pressure, high cholesterol, elevated blood sugar levels)?
4. Provide routine screening, follow-up counseling and education to patrons to help address chronic diseases and related risk factors (e.g., poor nutrition, physical inactivity, hypertension, high cholesterol, elevated blood sugar levels, tobacco use and exposure)?
5. Adopt curricula or training to raise awareness of the signs and symptoms of heart attacks and strokes?
6. Adopt curricula or training to raise awareness of the importance of calling 9-1-1 immediately when someone is having a heart attack or stroke?
7. Promote chronic disease prevention to patrons (e.g., post signs reminding patrons to get blood pressure checked, quit smoking, or avoid secondhand smoke)?
8. Adopt an emergency response plan (e.g., appropriate equipment such as Automatic External Defibrillator, instructions for action) in place?

Leadership

To what extent does the community institution/organization:

1. Provide incentives to patrons participating in chronic disease prevention measures (e.g., quit smoking, log miles walked, blood pressure or cholesterol screening)?

2. Participate in the public policy process to highlight the need for community changes to address chronic diseases and related risk factors (e.g., poor nutrition, physical inactivity, tobacco use and exposure)?
3. Have a wellness coordinator?
4. Have a wellness committee?
5. Have a health promotion budget?
6. Have a mission statement (or a written policy statement) that includes the support of or commitment to patron health and well-being?
7. Implement a needs assessment when planning a health promotion program?
8. Evaluate health promotion programs?
9. Provide opportunities for patron feedback (e.g., interest, satisfaction, adherence) about health promotion programs?
10. Participate in community coalitions and partnerships (e.g., food policy council, tobacco-free partnership, neighborhood safety coalition) to address chronic diseases and related risk factors (e.g., poor nutrition, physical inactivity, tobacco use and exposure)?

Appendix B – Script for recruiting and scheduling interviews

Hello. My name is_____and I'm a Master of Public Health Student at Wright State University. I am currently conducting research for my thesis project on how senior centers promote healthy lifestyle for the elderly. I would like to ask for your assistance in learning how healthy lifestyles are promoted through policies and environments in Montgomery County Senior centers. (NAME OF SENIOR CENTER) was randomly chosen from a list provided by Ohio Department of Aging. I would like to visit your senior center and interview an administrator, an activities coordinator along with two senior center participants, if possible. I will be asking a series of questions based on the CDC's community health assessment and group evaluation tool (also known as the CHANGE tool). Your decision to participate will be completely voluntary and no personal data including name of senior center and interviewee will be collected during this interview. The Wright State University Institutional Review Board has approved this study (SC#xxx).

The interview should take approximately one hour. A healthy, light lunch will be provided. Your participation will help identify and improve initiatives among Montgomery county senior centers to promote healthy living. A final copy of study will be mailed to your organization. This will help you self-assess and improve healthy living programs for seniors in your community. Would you be interested in participating?

IF NO: Okay, thank you for your time and commitment to senior citizens in our community!

IF YES: Great! When would be a good day and time for us to come to the center? Okay, great Xday at 00:00 . I will provide a light lunch/snack for all participants. Do you or any of the participants have any dietary requirements? Okay, we will see you at Xday the day of Month at 00:00!! If you have any questions or need to cancel reschedule, you can contact me at insert phone number.

Appendix C – Intro questions to interview (not to be recorded)

How long have you worked at this particular senior center?

Can you describe the population of seniors that (NAME OF SENIOR CENTER) serves?

> *Probes: Members of a specific geographical location, underprivileged neighborhood.*

On average, how many seniors attend (NAME OF SENIOR CENTER) Weekly? Monthly? Yearly?

Appendix D – Excel spreadsheet for CDC CHANGE TOOL

Community Health Assessment aNd Group Evaluation

COMMUNITY INSTITUTION/ORGANIZATION (CIO)

Additional information about the CIO can be included in the comment box denoted by the red corner tab.

CIO'S NAME:	

Module Score Summaries		
Policy	**Environment**	**Module**
0.00%	**0.00%**	**Physical Activity**
0.00%	**0.00%**	**Nutrition**
0.00%	**0.00%**	**Tobacco Use**
0.00%	**0.00%**	**Chronic Disease Management**
0.00%	**0.00%**	**Leadership**

GENERAL INSTRUCTIONS

Please indicate your answer by typing an 'X' or the correct information in the appropriate box for your response. Additional information can be included in each comment box denoted by the red corner tab.

DEMOGRAPHIC INFORMATION

Best description of the community setting *(choose ONE only):*	
Rural	
Suburban	
Urban	

Median household income in the community *(check the best estimated category):*	
< $25,000	
$25,000 – $34,999	
$35,000 – $49,999	
$50,000 – $74,999	
≥ $75,000	

Sector Type *(choose ONE only):*	
Private	
Public	

Profit Type *(choose ONE only):*	
For-Profit	
Not-for-Profit	

Total number of individuals being served	

Target Population *(choose ALL that apply):*	
Children/Youth* (ages: <18)	
Adults (ages: 18 – 64)	
Seniors/Older Adults (ages: 65+)	
Other, please specify:	
**** If serving children/youth, what grades being served*** *(choose ALL that apply)*:	
Preschool	
Elementary School	
Middle School	
High School	

Type of Institution/Organization *(choose ONE type only):*	
Senior Center	
Faith-based Organization	
Daycare Center	
Boys and Girls Club	
Health and Wellness Center	
University/College	
Other, please specify:	

Community Institution/Organization: Physical Activity

Based on your team's knowledge or observations of the community, use the following Policy and Environment scales to indicate the most appropriate responses for each statement. Position the cursor over each rating option to see further explanation and an example (examples provided are for item #1).

In the two response columns, please indicate the appropriate number (#) from the scales below that best represents your answers for each item. Provide both a Policy Response # and Environment Response # for each statement in the appropriate column, with supporting documentation in the corresponding comment boxes. Response # 99 should be used only when the strategy is not applicable at the site (e.g., stair promotion not suitable in one-story building).

Response #	Policy	Environment
1	Not identified as problem	Elements not in place
2	Problem identification/gaining agenda status	Few elements in place
3	Policy formulation and adoption	Some elements are in place
4	Policy implementation	Most elements are in place
5	Policy evaluation and enforcement	All elements in place
99	Not applicable	Not applicable

To what extent does the community institution/organization:	Policy Response #	Environment Response #	
1. Promote stairwell use (e.g., make stairs appealing, post motivational signs near stairs to encourage physical activity)?			
2. Provide a safe area outside (e.g., through lighting, signage, crime watch) to walk or be physically active?			
3. Designate a walking path on or near building property?			
4. Encourage non-motorized commutes (e.g., active transportation such as walk or bike) to the facility?			
5. Enhance access to public transportation (e.g., bus stops, light rail stops, van pool services, subway stations) within reasonable walking distance?			
6. Provide access to onsite fitness center, gymnasium, or physical activity classes?			
7. Provide a changing room or locker room with showers?			
8. Provide bicycle parking (e.g., bike rack, shelter) for patrons?			
9. Provide access to a broad range of competitive and noncompetitive physical activities that help to develop the skills needed to participate in lifetime physical activities?			
10. Provide opportunity for unstructured play or leisure-time physical activity?			
11. Prohibit using physical activity as a punishment?			
12. Restrict screen time to less than 2 hours per day for children over 2 years of age?			
13. Provide direct support (e.g., money, land, pavilion, recreational facilities, sponsorship, advertising) for supporting community-wide physical activity opportunities (e.g., sports teams, walking clubs)?			
COLUMN TOTAL:	**0**	**0**	**Please remember to answer every item. Do not leave any item blank.**
PHYSICAL ACTIVITY SCORE:	**0.00%**	**0.00%**	

Community Institution/Organization: Nutrition

Based on your team's knowledge or observations of the community, use the following Policy and Environment scales to indicate the most appropriate responses for each statement. Position the cursor over each rating option to see further explanation and an example (examples provided are for item #1).

In the two response columns, please indicate the appropriate number (#) from the scales below that best represents your answers for each item. Provide both a Policy Response # and Environment Response # for each statement in the appropriate column, with supporting documentation in the corresponding comment boxes. Response # 99 should be used only when the strategy is not applicable at the site (e.g., stair promotion not suitable in one-story building).

Response #	Policy	Environment
1	Not identified as problem	Elements not in place
2	Problem identification/gaining agenda status	Few elements in place
3	Policy formulation and adoption	Some elements are in place
4	Policy implementation	Most elements are in place
5	Policy evaluation and enforcement	All elements in place
99	Not applicable	Not applicable

To what extent does the community institution/organization:	Policy Response #	Environment Response #	
1. Institute healthy food and beverage options in vending machines?			
2. Institute healthy food and beverage options at institution-sponsored meetings and events?			
3. Institute healthy food and beverage options in onsite cafeteria and food venues?			
4. Institute healthy food purchasing (e.g., to reduce the caloric, sodium, and fat content of foods offered) for cafeteria and onsite food venues?			
5. Institute healthy food preparation practices (e.g., steaming, low fat, low salt, limiting frying) in onsite cafeteria and food venues?			
6. Institute pricing strategies that encourage the purchase of healthy food and beverage options?			
7. Ban marketing (e.g., counter advertisements, posters, other print materials) of less than healthy foods and beverages onsite?			
8. Provide smaller portion sizes in onsite cafeteria and food venues?			
9. Institute nutritional labeling (e.g., 'low fat,' 'light,' 'heart healthy,' 'no trans fat') at onsite cafeteria and food venues?			
10. Provide safe, unflavored, cool drinking water at no cost to patrons?			
11. Prohibit using food as a reward or punishment?			
12. Provide direct support (e.g., money, land, pavilion, sponsorship, advertising) for supporting community-wide nutrition opportunities (e.g., farmers' markets, community gardens)?			
13. Provide a comfortable, private space for women to nurse or pump to support and encourage patrons' ability to breastfeed?			
COLUMN TOTAL:	0	0	**Please remember to answer every item. Do not leave any item blank.**
NUTRITION SCORE:	0.00%	0.00%	

Community Institution/Organization: Tobacco

Based on your team's knowledge or observations of the community, use the following Policy and Environment scales to indicate the most appropriate responses for each statement. Position the cursor over each rating option to see further explanation and an example (examples provided are for item #1).

In the two response columns, please indicate the appropriate number (#) from the scales below that best represents your answers for each item. Provide both a Policy Response # and Environment Response # for each statement in the appropriate column, with supporting documentation in the corresponding comment boxes. Response # 99 should be used only when the strategy is not applicable at the site (e.g., stair promotion not suitable in one-story building).

Response #	Policy	Environment
1	Not identified as problem	Elements not in place
2	Problem identification/gaining agenda status	Few elements in place
3	Policy formulation and adoption	Some elements are in place
4	Policy implementation	Most elements are in place
5	Policy evaluation and enforcement	All elements in place
99	Not applicable	Not applicable

To what extent does the community institution/organization:	Policy Response #	Environment Response #	
1. Institute a smoke-free policy 24/7 for indoor public places?			
2. Institute a tobacco-free policy 24/7 for indoor public places?			
3. Institute a smoke-free policy 24/7 for outdoor public places?			
4. Institute a tobacco-free policy 24/7 for outdoor public places?			
5. Ban tobacco vending machine sales (including self-service displays)?			
6. Ban tobacco promotions, promotional offers, and prizes?			
7. Ban tobacco advertisement (e.g., restrict point-of-purchase advertising, product placement)?			
8. Implement a referral system to help patrons to access tobacco cessation resources and services, such as a quitline (e.g., 1-800-QUIT-NOW)?			
COLUMN TOTAL:	0	0	Please remember to answer every item. Do not leave any item blank.
TOBACCO USE SCORE:	0.00%	0.00%	

Community Institution/Organization: Chronic Disease Management

Based on your team's knowledge or observations of the community, use the following Policy and Environment scales to indicate the most appropriate responses for each statement. Position the cursor over each rating option to see further explanation and an example (examples provided are for item #1).

In the two response columns, please indicate the appropriate number (#) from the scales below that best represents your answers for each item. Provide both a Policy Response # and Environment Response # for each statement in the appropriate column, with supporting documentation in the corresponding comment boxes. Response # 99 should be used only when the strategy is not applicable at the site (e.g., stair promotion not suitable in one-story building).

Response #	Policy	Environment
1	Not identified as problem	Elements not in place
2	Problem identification/gaining agenda status	Few elements in place
3	Policy formulation and adoption	Some elements are in place
4	Policy implementation	Most elements are in place
5	Policy evaluation and enforcement	All elements in place
99	Not applicable	Not applicable

To what extent does the community institution/organization:	Policy Response #	Environment Response #	
1. Provide access to chronic disease self-management programs (e.g., Weight Watchers for overweight/obesity)?			
2. Provide access to an onsite nurse?			
3. Provide an onsite medical clinic to monitor and address chronic diseases and related risk factors (e.g., high blood pressure, high cholesterol, elevated blood sugar levels)?			
4. Provide routine screening, follow–up counseling and education to patrons to help address chronic diseases and related risk factors (e.g., poor nutrition, physical inactivity, hypertension, high cholesterol, elevated blood sugar levels, tobacco use and exposure)?			
5. Adopt curricula or training to raise awareness of the signs and symptoms of heart attacks and strokes?			
6. Adopt curricula or training to raise awareness of the importance of calling 9-1-1 immediately when someone is having a heart attack or stroke?			
7. Promote chronic disease prevention to patrons (e.g., post signs reminding patrons to get blood pressure checked, quit smoking, avoid secondhand smoke)?			
8. Have an emergency response plan (e.g., appropriate equipment such as Automatic External Defibrillator or instructions for action) in place?			
COLUMN TOTAL:	0	0	**Please remember to answer every item. Do not leave any item blank.**
CHRONIC DISEASE MANAGEMENT SCORE:	0.00%	0.00%	

Community Institution/Organization: Leadership

Based on your team's knowledge or observations of the community, use the following Policy and Environment scales to indicate the most appropriate responses for each statement. Position the cursor over each rating option to see further explanation and an example (examples provided are for item #1).

In the two response columns, please indicate the appropriate number (#) from the scales below that best represents your answers for each item. Provide both a Policy Response # and Environment Response # for each statement in the appropriate column, with supporting documentation in the corresponding comment boxes. Response # 99 should be used only when the strategy is not applicable at the site (e.g., stair promotion not suitable in one-story building).

Response #	Policy	Environment
1	Not identified as problem	Elements not in place
2	Problem identification/gaining agenda status	Few elements in place
3	Policy formulation and adoption	Some elements are in place
4	Policy implementation	Most elements are in place
5	Policy evaluation and enforcement	All elements in place
99	Not applicable	Not applicable

To what extent does the community institution/organization:	Policy Response #	Environment Response #	
1. Provide incentives to patrons participating in chronic disease prevention measures (e.g., quit smoking, log miles walked, blood pressure or cholesterol screening)?			
2. Participate in the public policy process to highlight the need for community changes to address chronic diseases and related risk factors (e.g., poor nutrition, physical inactivity, tobacco use and exposure)?			
3. Have a wellness coordinator?			
4. Have a wellness committee?			
5. Have a health promotion budget?			
6. Have a mission statement (or a written policy statement) that includes the support of or commitment to patron health and well-being?			
7. Implement a needs assessment when planning a health promotion program?			
8. Evaluate health promotion programs?			
9. Provide opportunities for patron feedback (e.g., interest, satisfaction, adherence) about health promotion programs?			
10. Participate in community coalitions and partnerships (e.g., food policy council, tobacco-free partnership, neighborhood safety coalition) to address chronic diseases and related risk factors (e.g., poor nutrition, physical inactivity, tobacco use and exposure)?			
COLUMN TOTAL:	**0**	**0**	**Please remember to answer every item. Do not leave any item blank.**
LEADERSHIP SCORE:	**0.00%**	**0.00%**	

Appendix E – Interview Guide

DEMOGRAPHIC INFORMATION

Best description of the community setting *(choose ONE only):*	
Rural	
Suburban	
Urban	

Median household income in the community *(check the best estimated category):*	
< $25,000	
$25,000 – $34,999	
$35,000 – $49,999	
$50,000 – $74,999	
≥ $75,000	

Sector Type *(choose ONE only):*	
Private	
Public	

Profit Type *(choose ONE only):*	
For-Profit	
Not-for-Profit	

Total number of individuals being served	

Target Population *(choose ALL that apply):*	
Children/Youth* (ages: <18)	
Adults (ages: 18 – 64)	
Seniors/Older Adults (ages: 65+)	
Other, please specify:	
**** If serving children/youth, what grades being served*** *(choose ALL that apply)*:	
Preschool	
Elementary School	
Middle School	
High School	

Type of Institution/Organization *(choose ONE type only):*	
Senior Center	
Faith-based Organization	
Daycare Center	
Boys and Girls Club	
Health and Wellness Center	
University/College	
Other, please specify:	

Response #	Policy	Environment
1	Not identified as problem	Elements not in place
2	Problem identification/gaining agenda status	Few elements in place
3	Policy formulation and adoption	Some elements are in place
4	Policy implementation	Most elements are in place
5	Policy evaluation and enforcement	All elements in place
99	Not applicable	Not applicable

Physical Activity

To what extent does the community institution/organization:	**Policy Response #**
1. **Promote** stairwell use (e.g., make stairs appealing, post motivational signs near stairs to encourage physical activity)?	
2. Provide a **safe area** outside (e.g., through lighting, signage, crime watch) to walk or be physically active?	
3. Designate a walking path on or near building property?	
4. Encourage non-motorized commutes (e.g., active transportation such as walk or bike) to the facility?	
5. **Enhance access** to public transportation (e.g., bus stops, light rail stops, van pool services, subway stations) within reasonable walking distance?	
6. Provide access to onsite fitness center, gymnasium, or physical activity classes?	
7. Provide a changing room or locker room with showers?	
8. Provide bicycle parking (e.g., bike rack, shelter) for patrons?	
9. Provide access to a broad range of competitive and noncompetitive physical activities that help to develop the skills needed to participate in **lifetime** physical activities?	
10. Provide opportunity for unstructured play or leisure-time physical activity?	
11. Prohibit using physical activity as a punishment?	
12. Restrict screen time to less than 2 hours per day for children over 2 years of age?	
13. Provide direct support (e.g., money, land, pavilion, recreational facilities, sponsorship, advertising) for supporting community-wide physical activity opportunities (e.g., sports teams, walking clubs)?	

Physical Activity

To what extent does the community institution/organization:	**Environment Response #**
1. **Promote** stairwell use (e.g., make stairs appealing, post motivational signs near stairs to encourage physical activity)?	
2. Provide a **safe area** outside (e.g., through lighting, signage, crime watch) to walk or be physically active?	
3. Designate a walking path on or near building property?	
4. Encourage non-motorized commutes (e.g., active transportation such as walk or bike) to the facility?	
5. **Enhance access** to public transportation (e.g., bus stops, light rail stops, van pool services, subway stations) within reasonable walking distance?	
6. Provide access to onsite fitness center, gymnasium, or physical activity classes?	
7. Provide a changing room or locker room with showers?	
8. Provide bicycle parking (e.g., bike rack, shelter) for patrons?	
9. Provide access to a broad range of competitive and noncompetitive physical activities that help to develop the skills needed to participate in **lifetime** physical activities?	
10. Provide opportunity for unstructured play or leisure-time physical activity?	
11. Prohibit using physical activity as a punishment?	
12. Restrict screen time to less than 2 hours per day for children over 2 years of age?	
13. Provide direct support (e.g., money, land, pavilion, recreational facilities, sponsorship, advertising) for supporting community-wide physical activity opportunities (e.g., sports teams, walking clubs)?	

Nutrition

To what extent does the community institution/organization:	**Policy Response #**
1. Institute healthy food and beverage options in vending machines?	
2. Institute healthy food and beverage options at institution-sponsored meetings and events?	
3. Institute healthy food and beverage options in onsite cafeteria and food venues?	
4. Institute healthy **food purchasing** (e.g., to reduce the caloric, sodium, and fat content of foods offered) for cafeteria and onsite food venues?	
5. Institute healthy **food preparation practices** (e.g., steaming, low fat, low salt, limiting frying) in onsite cafeteria and food venues?	
6. Institute pricing strategies that encourage the purchase of healthy food and beverage options?	
7. Ban marketing (e.g., counter advertisements, posters, other print materials) of less than healthy foods and beverages onsite?	
8. Provide smaller portion sizes in onsite cafeteria and food venues?	
9. Institute nutritional labeling (e.g., 'low fat,' 'light,' 'heart healthy,' 'no trans fat') at onsite cafeteria and food venues?	
10. Provide safe, unflavored, cool drinking water at no cost to patrons?	
11. Prohibit using food as a reward or punishment?	
12. Provide **direct support** (e.g., money, land, pavilion, sponsorship, advertising) for supporting community-wide nutrition opportunities (e.g., farmers' markets, community gardens)?	
13. Provide a comfortable, private space for women to nurse or pump to support and encourage patrons' ability to breastfeed?	

Nutrition

To what extent does the community institution/organization:	**Environment Response #**
1. Institute healthy food and beverage options in vending machines?	
2. Institute healthy food and beverage options at institution-sponsored meetings and events?	
3. Institute healthy food and beverage options in onsite cafeteria and food venues?	
4. Institute healthy **food purchasing** (e.g., to reduce the caloric, sodium, and fat content of foods offered) for cafeteria and onsite food venues?	
5. Institute healthy **food preparation practices** (e.g., steaming, low fat, low salt, limiting frying) in onsite cafeteria and food venues?	
6. Institute pricing strategies that encourage the purchase of healthy food and beverage options?	
7. Ban marketing (e.g., counter advertisements, posters, other print materials) of less than healthy foods and beverages onsite?	
8. Provide smaller portion sizes in onsite cafeteria and food venues?	
9. Institute nutritional labeling (e.g., 'low fat,' 'light,' 'heart healthy,' 'no trans fat') at onsite cafeteria and food venues?	
10. Provide safe, unflavored, cool drinking water at no cost to patrons?	
11. Prohibit using food as a reward or punishment?	
12. Provide **direct support** (e.g., money, land, pavilion, sponsorship, advertising) for supporting community-wide nutrition opportunities (e.g., farmers' markets, community gardens)?	
13. Provide a comfortable, private space for women to nurse or pump to support and encourage patrons' ability to breastfeed?	

Tobacco

To what extent does the community institution/organization:	**Policy Response #**
1. Institute a **smoke-free** policy 24/7 for **indoor** public places?	
2. Institute a **tobacco-free** policy 24/7 for **indoor** public places?	
3. Institute a **smoke-free** policy 24/7 for **outdoor** public places?	
4. Institute a **tobacco-free** policy 24/7 for **outdoor** public places?	
5. Ban tobacco vending machine sales (including self-service displays)?	
6. Ban tobacco promotions, promotional offers, and prizes?	
7. Ban tobacco advertisement (e.g., restrict point-of-purchase advertising, product placement)?	
8. Implement a referral system to help patrons to access tobacco cessation resources and services, such as a quitline (e.g., 1-800-QUIT-NOW)?	

Tobacco

To what extent does the community institution/organization:	**Environment Response #**
1. Institute a **smoke-free** policy 24/7 for **indoor** public places?	
2. Institute a **tobacco-free** policy 24/7 for **indoor** public places?	
3. Institute a **smoke-free** policy 24/7 for **outdoor** public places?	
4. Institute a **tobacco-free** policy 24/7 for **outdoor** public places?	
5. Ban tobacco vending machine sales (including self-service displays)?	
6. Ban tobacco promotions, promotional offers, and prizes?	
7. Ban tobacco advertisement (e.g., restrict point-of-purchase advertising, product placement)?	
8. Implement a referral system to help patrons to access tobacco cessation resources and services, such as a quitline (e.g., 1-800-QUIT-NOW)?	

Chronic Disease Management

To what extent does the community institution/organization:	**Policy Response #**
1. Provide access to chronic disease self-management programs (e.g., Weight Watchers for overweight/obesity)?	
2. Provide access to an onsite nurse?	
3. Provide an onsite medical clinic to monitor and address chronic diseases and related risk factors (e.g., high blood pressure, high cholesterol, elevated blood sugar levels)?	
4. Provide routine screening, follow–up counseling and education to patrons to help address chronic diseases and related risk factors (e.g., poor nutrition, physical inactivity, hypertension, high cholesterol, elevated blood sugar levels, tobacco use and exposure)?	
5. Adopt **curricula or training to raise awareness** of the signs and symptoms of heart attacks and strokes?	
6. Adopt **curricula or training to raise awareness** of the importance of calling 9-1-1 immediately when someone is having a heart attack or stroke?	
7. Promote chronic disease prevention to patrons (e.g., post signs reminding patrons to get blood pressure checked, quit smoking, avoid secondhand smoke)?	
8. Have an emergency response plan (e.g., appropriate equipment such as Automatic External Defibrillator or instructions for action) in place?	

Chronic Disease Management

To what extent does the community institution/organization:	**Environment Response #**
1. Provide access to chronic disease self-management programs (e.g., Weight Watchers for overweight/obesity)?	
2. Provide access to an onsite nurse?	
3. Provide an onsite medical clinic to monitor and address chronic diseases and related risk factors (e.g., high blood pressure, high cholesterol, elevated blood sugar levels)?	
4. Provide routine screening, follow–up counseling and education to patrons to help address chronic diseases and related risk factors (e.g., poor nutrition, physical inactivity, hypertension, high cholesterol, elevated blood sugar levels, tobacco use and exposure)?	
5. Adopt **curricula or training to raise awareness** of the signs and symptoms of heart attacks and strokes?	
6. Adopt **curricula or training to raise awareness** of the importance of calling 9-1-1 immediately when someone is having a heart attack or stroke?	
7. Promote chronic disease prevention to patrons (e.g., post signs reminding patrons to get blood pressure checked, quit smoking, avoid secondhand smoke)?	
8. Have an emergency response plan (e.g., appropriate equipment such as Automatic External Defibrillator or instructions for action) in place?	

Leadership

To what extent does the community institution/organization:	**Policy Response #**
1. Provide <u>incentives</u> to patrons participating in chronic disease prevention measures (e.g., quit smoking, log miles walked, blood pressure or cholesterol screening)?	
2. Participate in the <u>public policy process</u> to highlight the need for community changes to address chronic diseases and related risk factors (e.g., poor nutrition, physical inactivity, tobacco use and exposure)?	
3. Have a wellness coordinator?	
4. Have a wellness committee?	
5. Have a health promotion budget?	
6. Have a mission statement (or a written policy statement) that includes the support of or commitment to patron health and well-being?	
7. Implement a **needs assessment** when planning a health promotion program?	
8. **Evaluate** health promotion programs?	
9. Provide opportunities for patron **feedback** (e.g., interest, satisfaction, adherence) about health promotion programs?	
10. Participate in community coalitions and partnerships (e.g., food policy council, tobacco-free partnership, neighborhood safety coalition) to address chronic diseases and related risk factors (e.g., poor nutrition, physical inactivity, tobacco use and exposure)?	

Leadership

To what extent does the community institution/organization:	**Environment Response #**
1. Provide <u>incentives</u> to patrons participating in chronic disease prevention measures (e.g., quit smoking, log miles walked, blood pressure or cholesterol screening)?	
2. Participate in the <u>public policy process</u> to highlight the need for community changes to address chronic diseases and related risk factors (e.g., poor nutrition, physical inactivity, tobacco use and exposure)?	
3. Have a wellness coordinator?	
4. Have a wellness committee?	
5. Have a health promotion budget?	
6. Have a mission statement (or a written policy statement) that includes the support of or commitment to patron health and well-being?	
7. Implement a **needs assessment** when planning a health promotion program?	
8. **Evaluate** health promotion programs?	
9. Provide opportunities for patron **feedback** (e.g., interest, satisfaction, adherence) about health promotion programs?	
10. Participate in community coalitions and partnerships (e.g., food policy council, tobacco-free partnership, neighborhood safety coalition) to address chronic diseases and related risk factors (e.g., poor nutrition, physical inactivity, tobacco use and exposure)?	

Appendix F – Wright State University Institution Review Board Approval Letter

WRIGHT STATE UNIVERSITY

Office of Research and Sponsored Programs
201J University Hall
3640 Col. Glenn Hwy.
Dayton, OH 45435-0001
(937) 775-2425
(937) 775-3781 (FAX)
e-mail: rsp@wright.edu

DATE: March 28, 2012

TO: Abhinav Rajpal, P.I., Student
Public Health
Bill Spears, Ph.D., Fac. Adv.
Community Health

FROM: B. Laurel Elder, Chair
WSU Institutional Review Board

SUBJECT: SC# 4737
'Analyzing Healthy Lifestyle Initiatives in Select Senior Centers in Montgomery County, Ohio'

At the recommendation of the IRB Chair, your study referenced above has been recommended for exemption. Please note that any change in the protocol must be approved by the IRB; otherwise approval is terminated.

This action will be referred to the Full Institutional Review Board for ratification at their next scheduled meeting.

NOTE: This approval will automatically terminate two (2) years after the above date unless you submit a "continuing review" request (see http://www.wright.edu/rsp/IRB/CR_sc.doc) to RSP. You will not receive a notice from the IRB Office.

If you have any questions or require additional information, please call Robyn Wilks, IRB Coordinator at 775-4462.

Thank you!

Enclosure

Appendix G – Policy and Environment for All Montgomery County Senior Centers

Table 16. Weighted Average Policy Scores (n = 13)

CHANGE Category	Weighted Average Score
Overall Policy	65.2%
Physical Activity	62.0%
Nutrition	61.0%
Tobacco	75.3%
Chronic Disease Management	65.7%
Leadership	61.6%

Table 17. Weighted Average Environment Scores (n=13)

CHANGE Category	Weighted Average Score
Overall Environment	74.9%
Physical Activity	77.1%
Nutrition	71.2%
Tobacco	76.6%
Chronic Disease Management	75.3%
Leadership	72.5%

Appendix H – Public Health Competencies Met

Specific Competencies
Domain #1: Analytic Assessment Skill
Defines a problems
Determines appropriate uses and limitations of both quantitative and qualitative data
Selects and defines variables relevant to defined public health problems
Identifies relevant and appropriate data and information sources
Evaluates the integrity and comparability of data and identifies gaps in data sources
Applies ethical principles to the collection, maintenance, use, and dissemination of data and information
Partners with communities to attach meaning to collected quantitative and qualitative data
Makes relevant inferences from quantitative and qualitative data
Obtains and interprets information regarding risks and benefits to the community
Applies data collection processes, information technology applications, and computer systems storage/retrieval strategies
Recognizes how the data illuminates ethical, political, scientific, economic, and overall public health issues
Domain #2: Policy Development/Program Planning Skills
Collects, summarizes, and interprets information relevant to an issue
Identifies, interprets, and implements public health laws, regulations, and policies related to specific programs
Domain #3: Communication Skills
Communicates effectively both in writing and orally, or in other ways
Solicits input from individuals and organizations
Advocates for public health programs and resources
Leads and participates in groups to address specific issues
Uses the media, advanced technologies, and community networks to communicate information
Effectively presents accurate demographic, statistical, programmatic, and scientific information for professional and lay audiences
Attitudes
Listens to others in an unbiased manner, respects points of view of others, and promotes the expression of diverse opinions and perspectives
Domain #4: Cultural Competency Skills
Utilizes appropriate methods for interacting sensitively, effectively, and professionally with persons from diverse cultural, socioeconomic, educational, racial, ethnic and professional backgrounds, and persons of all ages and lifestyle preferences
Identifies the role of cultural, social, and behavioral factors in determining the delivery of public health services
Develops and adapts approaches to problems that take into account cultural differences
Attitudes
Understands the dynamic forces contributing to cultural diversity
Understands the importance of a diverse public health workforce

Specific Competencies
Domain #5: Community Dimensions of Practice Skills
Establishes and maintains linkages with key stakeholders
Identifies community assets and available resources
Develops, implements, and evaluates a community public health assessment
Domain #6: Basic Public Health Sciences Skills
Identifies the individual's and organization's responsibilities within the context of the Essential Public Health Services and core functions
Identifies and applies basic research methods used in public health
Applies the basic public health sciences including behavioral and social sciences, biostatistics, epidemiology, environmental public health, and prevention of chronic and infectious diseases and injuries
Identifies and retrieves current relevant scientific evidence
Identifies the limitations of research and the importance of observations and interrelationships
Attitudes
Develops a lifelong commitment to rigorous critical thinking
Domain #7: Financial Planning and Management Skills - N/A
Domain #8: Leadership and Systems Thinking Skills - N/A